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Afrotropical Asilinae (Asilidae): A provisional key to genera, with a review of the status of *Neomochtherus* Osten Sacken, 1878, and descriptions of new genera and species

by

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ABSTRACT

An annotated key to the genera of afrotropical Asilinae is provided. The key is provisional as some genera, not examined in this paper, still require revision, and the occurrence of others in the region require confirmation.

The afrotropical species of *Neomochtherus* Osten Sacken, 1878 *sensu* Tsacas (1969) are reviewed in view of Lehr's (1969) action of splitting the genus into five separate genera (i.e. *Afromochtherus* Lehr, *Aneomochtherus* Lehr, *Neomochtherus*, *Pashtshenkoa* Lehr and *Tsacasiella* Lehr). Research supports the validity of *Afromochtherus*, *Aneomochtherus* and *Tsacasiella*, but suggests that there are no afrotropical species that should be placed in *Neomochtherus* or *Pashtshenkoa*. New genera are erected for the species placed in the latter two genera by Lehr (i.e. *Caenoura* and *Melouromyia*). Five additional genera (*Dikowmyia*, *Gongromyia*, *Notomochtherus*, *Sphagomyia* and *Valiraptor*) are described to accommodate a number of previously undescribed southern African species. Tables and maps are provided that summarise the findings of this paper. In all, 37 species placed in 10 genera are recognised.

New genera: *Caenoura* (Type-species: *Mochtherus annulitarsis* Loew, 1858); *Dikowmyia* (Type-species: *Dikowmyia mediorus* sp. n.); *Gongromyia* (Type-species: *Gongromyia bulla* sp. n.); *Melouromyia* (Type-species: *Heligmonevra natalensis* Ricardo, 1919); *Notomochtherus* (Type-species: *Notomochtherus brevicauda* sp. n.); *Sphagomyia* (Type-species: *Sphagomyia botswana* sp. n.); *Valiraptor* (Type-species: *Valiraptor silvestris* sp. n.).

New species: *Afromochtherus – anatolicus* (South Africa); *astiptus* (Namibia); *kolodrillus* (South Africa); *malawi* (Malawi); *megastylus* (Namibia); *melanurus* (South Africa); *mkomazi* (Tanzania); *peri* (South Africa, Botswana); *sathus* (Zimbabwe, Zambia); *zoropegus* (South Africa). *Dikowmyia – mediorus* (South Africa). *Gongromyia – bulla* (South Africa). *Melouromyia – diaphorus* (South Africa). *Notomochtherus – brevicauda* (South Africa). *Sphagomyia – botswana* (Botswana, South Africa); *kenya* (Kenya). *Tsacasiella – inornata* (Namibia, Botswana, Malawi, Zimbabwe). *Valiraptor – montanus* (South Africa); *namibiensis* (Namibia); *silvestris* (South Africa); *vittatus* (South Africa).

New synonyms: *Dinozabrus* Hull, 1962 = *Machimus* Loew, 1849; *Neomochtherus callipygus* Tsacas, 1969 = *Tsacasiella blanda* (Tsacas, 1969); *Neomochtherus genialis* Tsacas, 1969 = *Afromochtherus unctus* (Oldroyd, 1939); *Neomochtherus notatus* Tsacas, 1969 = *Tsacasiella futilis* (Tsacas, 1969); *Neomochtherus ochrapes* Hull, 1967 = *Caenoura annulitarsis* (Loew, 1858); *Neomochtherus signatipes* Lindner, 1955 = *Aneomochtherus africanus* (Ricardo, 1919). Although previously suggested, *Cobalomyia* Hull, 1962 is here confirmed to be a synonym of *Heligmonevra* Bigot, 1858.

New combinations: *Caenoura annulitarsis* (Loew, 1858) and *Caenoura sinuatus* (Loew, 1858), both transferred from *Neomochtherus*; *Melouromyia natalensis* (Ricardo, 1919) transferred from *Pashtshenkoa* (originally *Heligmonevra*).

Type-locality designations: *Mochtherus annulitarsis* Loew, 1858; *Mochtherus sinuatus* Loew, 1858; *Heligmonevra natalensis* Ricardo, 1919.

INTRODUCTION

With the publication by Lehr (1996) of a major contribution to the taxonomy of the Asilinae, in which a number of well established afrotropical species were transferred to newly or recently described genera, most of which comprise chiefly palaearctic species, I decided to examine the extensive collection of Asilidae at the Natal Museum and to familiarise myself with the way in which Lehr viewed the taxa concerned. It soon became evident that a number of problems existed that made the identification of afrotropical asiline genera difficult. Some of the problems were not new; for example, the arrangement of genera in the most recent afrotropical catalogue (Oldroyd 1980) does not follow higher classifications developed and accepted for other regional faunas (e.g. Artigas & Papavero's 1988 arrangement for American taxa). This meant the necessity of reassessing the subfamilial placement of genera in order to establish which should be included in the afrotropical asiline fauna. Other long-standing problems concerned genera such as the monotypic *Cobalomyia* Hull, 1962, recognised as a valid genus in the 1980 catalogue, but combined with *Heligmonevra* Bigot, 1858 in the latest revision (Martin 1964). Looking through the Natal Museum's material also revealed that there were apparently many undescribed species which needed to be dealt with, especially in what was thought to have been a well studied genus, *Neomochtherus* Osten Sacken. This genus received relatively recent attention by Tsacas (1969), then the recognised authority on the group, world-wide. Although Tsacas' work was thorough and the taxa clearly diagnosed, it was obvious that he had not seen the bulk of the Natal Museum's collection, dominated by specimens from southern Africa, a region very poorly represented in his 1969 study.

Lehr's (1996) genera posed another set of problems, mostly relating to their establishment chiefly on the grounds of differences difficult to define in male genital form. As most of the afrotropical asiline species, in virtually all the genera, have never been adequately dissected to reveal details of aedeagal structure, comparisons with the palaearctic species studied in some detail by Lehr were impossible.

In my study I set out to achieve three main objectives: (1) to clarify which afrotropical genera belong to the subfamily Asilinae, (2) to ascertain the validity of the genera established by Lehr that have afrotropical representatives, and (3) to report on the many southern African species represented in the Natal Museum's collection. As these projects are not mutually exclusive, it is important to understand and accept that information presented early in this paper may of necessity reflect decisions supported later in the paper.

Lehr's genera that I considered needed re-evaluation all emanated from his belief that *Neomochtherus* was polyphyletic, composed of a number of species groups worthy of generic status. The second of the two objectives listed above was therefore essentially a revision of afrotropical *Neomochtherus*. It is consequently useful to consider briefly the circumstances existing before and after the publication of Lehr's (1996) findings.

The afrotropical *Neomochtherus* species had been reviewed by Tsacas (1969), with 20 species included in the genus. The afrotropical catalogue (Oldroyd 1980) subsequently listed 24 species. Those not included in Tsacas' (1969) review were: *N. arabicus* (Macquart, 1838), *N. nudus* (Bezzi, 1906), *N. ochrapes* Hull, 1967 and *N. rothkirchii* (Speiser, 1913) (species that will be discussed later in this paper).

Tsacas (1969), recognising that there were clusters of related species within *Neomochtherus*, arranged most of them into four species groups that he briefly attempted to define. Two species, more difficult to assign, were left ungrouped. Lehr (1996), working with the palaearctic fauna (which had been reviewed by Tsacas (1968)), also recognised groups within *Neomochtherus*, but decided to establish them as separate genera. In the process, Lehr also decided to elevate Tsacas' (1969) afrotropical species groups to full genera, basing these on the brief diagnoses and illustrations provided by Tsacas (1969). Table 1 summarises how Lehr (1996) reclassified Tsacas' (1969) afrotropical *Neomochtherus* species (names of authors and dates of publications are provided in full elsewhere).

TABLE 1

A summary of how Lehr (1996) classified the afrotropical *Neomochtherus* species reviewed by Tsacas (1969).

Tsacas (1969)	Lehr (1996)
***N. atrox* species group**	
N. atrox	Assigned to *Afromochtherus* Lehr with no other species included.
N. genialis	
N. mendax	
N. unctus	
***N. neavei* species group**	
N. blandus	Assigned to *Tsacasiella* Lehr with *instabilis* being the only other species included (see below).
N. callipygus	
N. debilis	
N. exilis	
N. futilis	
N. kivuensis	
N. neavei	
***N. annulitarsis* species group**	
N. annulitarsis	Retained in *Neomochtherus* Sacken.
N. sinuatus	
***N. signatipes* species group**	
N. africanus	Assigned to *Aneomochtherus* Lehr, except for *natalensis*, which was assigned to *Pashtshenkoa* Lehr. Also added *N. ochrapes* Hull (not known or discussed, by Tsacas) to *Aneomochtherus.*
N. deserticola	
N. monobia	
N. natalensis	
N. signatipes	
Species not grouped	
N. instabilis	Assigned to *Tsacasiella* (see above).
N. notatus	Made no mention of this species.

Lehr (1996) grouped the afrotropical *Neomochtherus* species into five genera as follows:

Afromochtherus Lehr, 1996 – *atrox* (Tsacas, 1969), *genialis* (Tsacas, 1969), *mendax* (Tsacas, 1969), *unctus* (Oldroyd, 1939).

Aneomochtherus Lehr, 1996 – *africanus* (Ricardo, 1919), *deserticolus* (Karsch, 1888), *monobius* (Speiser, 1910), *ochrapes* (Hull, 1967), *signatipes* (Lindner, 1955).

Neomochtherus Osten Sacken, 1878 – *annulitarsis* (Loew, 1858), *sinuatus* (Loew, 1858).

Pashtshenkoa Lehr, 1995 – *natalensis* (Ricardo, 1919).

Tsacasiella Lehr, 1996 – *blandus* (Tsacas, 1969), *callipygus* (Tsacas, 1969), *debilis* (Tsacas, 1969), *exilis* (Tsacas, 1969), *futilis* (Tsacas, 1969), *instabilis* (Tsacas, 1969), *kivuensis* (Tsacas, 1969), *neavei* (Ricardo, 1919).

In so doing, Lehr neglected to mention four Oldroyd-catalogued afrotropical species of *Neomochtherus* (i.e. *arabicus* Macquart, 1838, *notatus* Tsacas, 1969, *nudus* (Bezzi, 1906), *rothkirchii* (Speiser, 1913)).

Lehr's (1996) generic diagnoses are generally unsubstantial and, in the absence of good keys, the reader is left with the task of studying the many illustrations, some quite difficult to interpret, in order to formulate an overall impression of the genera. It was therefore necessary to re-evaluate the genera, using identified material of as many of the species as possible. As it was not practical to examine all the palaearctic taxa, my study was confined to the afrotropical species, except where other extralimital material was readily available.

MATERIALS AND METHODS

The material studied is housed in the Natal Museum (NMSA), unless otherwise indicated. Other institutions providing specimens are listed below, together with the abbreviations used in the text when citing these repositories.

BMNH – The Natural History Museum, London, United Kingdom
MNHN – Museum National d'Histoire Naturelle, Paris, France
MRAC – Musee Royal de l'Afrique Centrale, Tervuren, Belgium
MZLU – Zoological Museum, Dept. Zoology, Lund, Sweden
NHRS – Naturhistoriska Riksmuseet, Stockholm, Sweden
NMNW – State Museum, Windhoek, Namibia
SAMC – South African Museum, Cape Town, South Africa
SMNS – Staatliches Museum Für Naturkunde Stuttgart, Stuttgart, Germany
ZMHB – Zoologisches Museum, Berlin, Germany

Note: The holotypes of five of Tsacas' species (*atrox*, *blandus*, *callipygus*, *debilis*, *exilis*), deposited in MRAC, were sent to me for study. Unfortunately the specimens became detached from the base of the box during transit and all sustained significant damage. An attempt was made to associate the many fragments that were found in the box with the five specimens. Six capsules were filled with these fragments; five were labelled with the suggested species name, while the sixth, containing many unidentifiable leg fragments, was labelled with the names of all five species. Fortunately the genitalia vials did not become separated from the labelled pins and so remain as useful as ever. Notes on the condition of each of the specimens involved are provided in this paper.

In recording label data for studied type material, a standard format is used where information contained on each label is demarcated by the use of single inverted commas, each line of data being separated by a slash (/). The ~ symbol indicates that subsequent data are on the reverse side of the label just documented, while square brackets are used to indicate useful additional information not found on labels. When recording data for other material (i.e. specimens without type status), information is also given, where available, in a standard order (place name; grid reference or co-ordinates, altitude, date of collection (month usually indicated in roman numerals); collector (excluding initials if a surname is provided); institution housing material (in parentheses), if ***not*** the Natal Museum. Specimens are also arranged in geographical order (i.e. according to latitude and longitude) to facilitate mapping. Long lists of material representing two species (*C. annulitarsis* and *M. natalensis*) have been greatly reduced by eliminating most of the data except for actual locality information (name of place), co-ordinates (or grid reference) and altitude information. These species have been mapped and their phenologies tabled.

In all instances, specimens were dry-mounted on pins. Drawings were executed with the aid of a drawing tube, male terminalia being first removed and macerated in warm potassium hydroxide. Genitalia were stored temporarily in glass vials containing 70 % ethanol, until the completion of the study, when they were sealed in polyethylene genitalia vials containing a mixture of ethanol and glycerine and attached to the specimen pins.

Long, repetitive descriptions have been avoided by: (1) providing concise diagnoses for all new taxa, (2) placing information in keys, (3) giving many illustrations, and (4) providing tabulated character matrices (Tables 3–4). In descriptive passages the use of a few standard abbreviations has also contributed to economy of space. While terminology and abbreviations used generally follow McAlpine (1981), use of the term postpedicel for the antennal component between pedicel and style follows Stuckenberg (1999).

Final illustrations were prepared from pencil drawings and, in almost all instances, do not show setae, as the shape of structures is considered more important than setal number or distribution. Illustrations of male genitalia may also lack features that occur behind others—for example, when illustrating the ventral view, details of the proctiger are usually omitted as this organ is shown in dorsal view. Illustrations of the aedeagus and gonostylus were almost invariably done after removal of these organs by dissection. As such dissections are time-consuming and may make future study of the stored genitalia more difficult, dissection was restricted to an absolute minimum. Wings were not removed from specimens for illustration and so some may not have been as flat as I would have wished, and may have had small parts bent or buckled such that their illustrated shapes were not perfect. Although measurements are not provided, as most species show considerable variation, scale lines on all illustrations provide an indication of size.

TAXONOMY

Afrotropical Asilinae

A number of different classifications have been proposed for the Asilidae in recent years. The classification proposed by Papavero (1973) and subsequently developed by Artigas & Papavero (1988), within an American context, appears to have general, global application. I have adopted the subfamily arrangement proposed by Artigas & Papavero (1988) as I have, for the most part, found the subfamilial characters used by them to be useful in an afrotropical context. As the Artigas & Papavero (1988) publication may not be easily accessible, their key is here provided, in a slightly abbreviated form, for the convenience of readers. It is possible that this key may require fine-tuning for use in an afrotropical context, but this will only become evident with its repeated use with this fauna.

Key to the subfamilies and genera of afrotropical Asilidae

1 Abdominal tergum 2 (T2) five or more times longer than wide; abdominal sternum 1 (S1) extending about halfway back under T2; alula and pulvilli absent .... **Leptogastrinae** Schiner, 1862

– T2 no more than four times longer than wide; S1 confined beneath T1; alula and pulvilli usually present, but occasionally one or the other may be absent 2

2 Tibia 1 with an apical spur (i.e. an enlarged spine, usually twisted and sigmoid in shape); prosternum dissociated by a membranous area from proepisternum .... **Dasypogoninae** Macquart, 1838

– Tibia 1 without an apical spur; prosternum either dissociated from proepisternum or fused to it 3

3 Apex of R_{2+3} directed sharply forward, meeting C at an angle of about 90°, ending either at distal end of R_1 (when cell r_1 is closed) or a short distance from R_1 along C (when cell r_1 is open); R_4 strongly sinuate and arched forward after separation from R_5; prosternum fused to proepisternum; male with only six abdominal terga visible dorsally .... **Laphystiinae** Macquart, 1838

– Radial veins not as described above; prosternum dissociated from proepisternum or fused to it; male with six to eight tergites dorsally 4

4 R_{2+3} ending in C, cell r_1 thus open on the wing margin; supero-posterior angle of anepisternum without a strong macroseta and katatergite without a row of macrosetae. 5

– R_{2+3} joining R_1 proximal to end of R_1, cell r_1 thus closed and separated from wing margin; either anepisternum with at least one macroseta on supero-posterior angle, or katatergite with a vertical row of macrosetae. 7

5 Prosternum dissociated from proepisternum by a membranous are ....
Stenopogoninae Hull, 1962

– Prosternum fused to proepisternum, forming a precoxal bridge 6

6 Frons narrowed at level of insertion of antennae and then abruptly diverging apically such that eyes are much more distant at vertex than at antennal level; vertex shallowly excavated; face without tentorial pits or grooves and flat above and prominent below or very gibbose; posterodorsal corner of metepimeron bare; abdomen usually longer than width of wing; female terminalia with acanthophorites and ventral keel-like subgenital plate .... **Stichopogoninae** Hardy, 1930

– Frons approximately the same width at level of insertion of antennae and vertex; vertex deeply excavated; face with tentorial pits or grooves and not produced beyond eye margin (in lateral view); posterolateral corners of metepimeron with short setae; abdomen usually shorter than width of wing; female terminalia simple, tubular, without spines .... **Trigonomiminae** Enderlein, 1914

7 Anepisternum with at least one strong, long macroseta at posterodorsal corner, in front of wing insertion; katatergite never with a vertical row of macrosetae; prosternum fused to proepisternum; palp one or two-segmented; female terminalia without spines .... **Laphriinae** Macquart, 1838

– Anepisternum never with strong macroseta at superoposterior angle, in front of wing insertion; katatergite with a vertical row of macrosetae; prosternum dissociated from proepisternum or fused with it; palp one-segmented; female terminalia with or without spines 8

8 Anatergite bare 9

– Anatergite setose .... **Asilinae** Leach, 1819

9 Antennal stylus plumose; postmetacoxal area sclerotised, forming a complete bridge behind coxae .... **Ommatiinae** Hardy, 1927

– Antennal stylus bare; postmetacoxal area membranous.....**Apocleinae** Lehr, 1969

All the genera included in the key to afrotropical genera, provided below, are in the Asilinae *sensu* Artigas & Papavero (1988). The subfamily concept used by

Oldroyd (1980) in his important afrotropical catalogue differs. Using Artigas & Papavero's (1988) concept of asilid subfamilies, Oldroyd's (1980) genera would be arranged as indicated in Table 2 (in which recent taxonomic adjustments are indicated).

TABLE 2
Assignment of Oldroyd's (1980) catalogued genera of Asilinae to Artigas & Papavero's (1988) subfamilies.

Oldroyd's (1980) Asilinae genera	**Currently accepted generic name and remarks if necessary**	**Artigas & Papavero's subfamily designation**
Alcimus Loew, 1848	No change	Apocleinae
Antilophonotus Lindner, 1955	Synonym of *Neolophonotus*	Apocleinae
Apoclea Macquart, 1838	No change	Apocleinae
Asilus Linnaeus, 1758	No change	Asilinae
Astochia Becker, 1913	No change	Asilinae
Bactria Meigen, 1820	No change	Apocleinae
Cerdistus Loew, 1848	No change	Asilinae
Cobalomyia Hull, 1962	Synonym of *Heligmonevra* (this paper)	Asilinae
Congomochtherus Oldroyd, 1970	No change	Asilinae
Cophinopoda Hull, 1958	No change	Ommatiinae
Dasophrys Loew, 1858	No change	Apocleinae
Dinozabrus Hull, 1962	Synonym of *Machimus* (this paper)	Asilinae
Dysclytus Loew, 1858	No change	Apocleinae
Erax Scopoli, 1763	No change	Apocleinae
Heligmonevra Bigot, 1858	No change	Asilinae
Hobbyus Bromley, 1933	Synonym of *Dasophrys*	Apocleinae
Hoplopheromerus Becker, 1925	No change	Asilinae
Lycoprosopa Hull, 1962	No change	Apocleinae
Machimus Loew, 1849	No change	Asilinae
Megadrillus Bigot, 1857	Synonym of *Neolophonotus*	Apocleinae
Michotamia Macquart, 1838	No change	Ommatiinae
Neolophonotus Engel, 1838	No change	Apocleinae
Neomochtherus Osten Sacken, 1849	No afrotropical species (this paper)	Asilinae
Ommatius Wiedemann, 1821	No change	Ommatiinae
Philodicus Loew, 1848	No change	Apocleinae
Promachus Loew, 1848	No change	Apocleinae
Rhadiurgus Loew, 1849	No afrotropical species (this paper)	Asilinae
Senoprosopis Macquart, 1838	No afrotropical species	Asilinae
Synolcus Loew, 1858	No change	Apocleinae
Thallosia Oldroyd, 1970	No change	Ommatiinae

The present study covers only the Asilinae genera *sensu* Artigas & Papavero (1988) as listed in Table 2. The key which follows includes all these genera except for those listed below, for the reasons stated.

Asilus Linnaeus, 1758:605. (Type-species: *Asilus crabroniformis* Linnaeus, 1758, by designation of Latreille (1810:443)). Although Oldroyd (1980) lists 10 species of *Asilus* as being afrotropical, most of these species apparently lack types and cannot be assigned to any of the recognised afrotropical genera. It is generally considered that the genus does not occur in the region (see discussion in Londt (1985:49)), and thus has been excluded from this study.

Cobalomyia Hull, 1962:588 (Type-species: *Senoprosopis fanovanensis* Bromley, 1942, by original designation). The single species catalogued by Oldroyd (1980), *fanovanensis* Bromley, 1942:19, (described in *Senoprosopis*) from Madagascar, was treated as a *Heligmonevra* by Martin (1964), who reviewed the Madagascan fauna. Although Martin (1964) expressed uncertainty about the generic position of *Cobalomyia*, he stated 'I am following Oldroyd (1959) in continuing to use *Heligmoneura* rather than *Cobalomyia* for the species from Madagascar'. I believe Martin's statement constitutes a declaration of synonymy and, because it is difficult to find adequate grounds to support *Cobalomyia*, propose to accept it as such. Oldroyd (1980), however, for reasons not divulged (but probably because he considered that Martin had not made a clear statement of synonymy), decided to retain *Cobalomyia*. Accepting *Cobalomyia* Hull, 1962 as a synonym of *Heligmonevra* gives grounds for the validation of the binomial *Heligmonevra fanovanensis* (Bromley, 1942). For comparative purposes I provide new illustrations of the male genitalia (Figs 1–5) of a NMSA specimen labelled 'Madagascar-Nord, Montagne d'Ambre, 1000m, dct Diego-Suarez, 23.xi–4.xii.1957, B. Stuckenberg', and identified as *fanovanensis* by Oldroyd.

Dinozabrus Hull, 1962:573 (Type-species: *Dinozabrus bicolor* Hull, 1962, by original designation). I have studied a single male (donated to NMSA by BMNH) labelled 'Brit. E. Afr. [= Kenya], S.E. slopes of Kenya [i.e. Mt. Kenya], 6000–7000 ft, Feb. 3–12, 1911, S. A. Neave', and here provide illustrations of the genitalia (Figs 9–14) for comparative purposes. As I am unable to find good characters to distinguish *Dinozabrus* from *Machimus* Loew, I consider it to be synonymous. *Dinozabrus* is therefore a new synonym of *Machimus*. This action validates the binomial *Machimus bicolor* (Hull, 1962) **comb. n.**

Neomochtherus Osten Sacken, 1878:82, 235 (a replacement name for *Mochtherus* Loew, 1849: 58 (as subgenus of *Asilus*). Type-species: *Asilus pallipes* Meigen, 1820, by designation of Coquillett (1910:571) as the genus was a junior homonym, preocc. *Mochtherus* Schmidt-Goebel, 1846). As mentioned earlier, Oldroyd (1980) listed 24 afrotropical species, most of which were reviewed by Tsacas (1969). Although Lehr (1996) retained two afrotropical species (*annulitarsis* Loew and *sinuatus*, Loew) in *Neomochtherus*, these species are clearly misplaced and are assigned to a new genus diagnosed in this paper (i.e. *Caenoura*). As Lehr (1996) reassigned all of Tsacas' (1968) North African species of *Neomochtherus* to *Aneomochtherus*, *Pashtshenkoa* and *Paramochtherus* Theodor, 1980, there are now no recognised species of *Neomochtherus* in Africa, the genus being confined to the Palaearctic Region.

Rhadiurgus Loew, 1849:133 (as subgenus of *Asilus*). (Type-species: *Asilus variabilis* Zetterstedt, 1838, by monotypy). Although Oldroyd (1980) catalogues the genus, with *notatus* Bigot, 1891: 371, from Ivory Coast, as the only afrotropical species, he also lists this species as a synonym of *Philodicus temerarius* Walker, 1851. Blasdale (1957) clearly synonymised *R. notatus* (and four other species) with *P. temerarius*.

This synonymy, also overlooked by Hull (1962), must be accepted, so *Rhadiurgus* can no longer be listed as an afrotropical genus.

Senoprosopis Macquart, 1838, with its single catalogued afrotropical species, *coxalis* Becker, 1922, was the subject of a recent paper (Londt 2002), in which the species was transferred to *Stenopogon* Loew, 1848. This leaves *Senoprosopis* monotypic and confined to the Oriental Region.

In addition to Oldroyd's (1980) catalogued genera the following key takes into account three genera to which afrotropical species were assigned by Lehr (1996), i.e. *Afromochtherus* Lehr, 1996, *Tsacasiella* Lehr, 1996, and *Pashtshenkoa* Lehr, 1995. While the first two are recognised as valid afrotropical genera, the single species assigned by Lehr to *Pashtshenkoa* is now placed in a new genus, *Melouromyia*, along with a second, newly described species.

Asilinae character matrix

Comments on the characters used in the construction of a character matrix (Table 3) follow, character numbers being the same as in the table.

Head

1. Antennal style; number of elements including terminal spine: In most instances it is easy to discern the number of elements and to see clearly the small basal element (segment) of the style, should it be present. Where this element is thought to be absent the style is usually thin and straight, and so it is possible that the basal element is merely difficult to discern.
2. Antennal postpedicel; length relative to scape: These measurements, usually taken in lateral view, present no problems.
3. Antennal scape; predominant colour: This segment is either darkly coloured (blackish) or fairly pale (yellowish). Teneral specimens may prove problematic.
4. Face; extent of gibbosity: This is not an easy character to assess. Strongly protruding faces are fairly easy to discern, but the difference between weak and moderate may only be fully appreciated by looking at many examples.
5. Face; width relative to head: Measurements were taken of the anterior view of the head and face and at the same level (i.e. where the head is widest).

Thorax

6. Postpronotal lobe; setal development: All genera except *Afromochtherus* have long, thin setae. If setae are both long and short then the condition is considered long. The number of setae may vary and is not important when assessing length. A few *Afromochtherus* species found in the northern parts of the known range of the genus are a little more difficult to assess, as the setae are fairly sparse and may be of intermediate length.
7. Mesonotum; development of dorsocentral macrosetae: All species have dorsocentral macrosetae posterior to the transverse suture. Care must be taken in assessing whether a seta is a macroseta or not. The best method is to look for a clearly discernible setal socket, characteristic of macrosetae.
8. Scutellum; number of marginal macrosetae: These are usually easy to count except when they are relatively thin and associated with finer setae. An odd number of macrosetae is taken as the presence of an extra one (i.e. for 3 record 2).

TABLE 3

Character matrix constructed during a study of afroatropical Asilinae genera.

Character

Genus	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Afromochtherus	3	2	2	2	1	1	1	1	2	2	3	1	1	2
Aneomochtherus	3	2	1	2	1	2	3	1	1	2	3	1	2	2
Astochia	2–3	2	1	3	1	2	3	1	1	2	1	1	2?	1
Caenoura	3	1	1	2	1	2	3	1	1	3	3	1	2	2
Cerdistus[1]	3	2	1	2	1	2	3	1	1	1	3	1	1	1–2
Cobalomyia[2]	3	2	2	1	2	2	2	1	1	3	3	1	2	1
Congomochtherus	3	2	1	2	1	2	2	1	1	1	3	2	1	1
Dikowmyia	3	1	1	2	1	2	3	1	1	2	3	1	2	2
Dinozabrus[3]	3	2	1	3	1	2	3	2	2	1	?	1	4	1
Gongromyia	3	2	1	2	1	2	2	1	1	2	3	1	2	2
Heligmonevra	2	2	2	2	1	2	2	1	1	3	3	1	2	1
Hoplopheromerus	2	2	1	2	1	2	1	1	2	1	2	3	1	1
Machimus	3	2	1	3	1	2	3	2	1+	1	3	1	4	1
Melouromyia	3	2	1	2	1	2	3	1	1	2	3	1	1	2
Neomochtherus[4]	3	2	1	1	1	2	1	1	1	3	3	1	1	1–2
Notomochtherus	3	2	1	2	1	2	3	1	3?	1	3	1	2	1
Sphagomyia	3	2	2	2	1	2	2	1	1	2–3	3	1	3	2
Tsacasiella	3	2	2	1	1	2	3	1	1	3	3	1	1	2
Valiraptor	3	2	1	2	1	2	3	1	1	2	3	1	4	1

Notes

1 Specimens identified and labelled by Hradsky as *C. geniculatus* were used.
2 The genus is synonymised with *Heligmonevra* in this paper.
3 The genus is synonymised with *Machimus* in this paper.
4 Specimens identified and labelled by Hradsky as *N. pallipes* were used.

Characters:

Head:

1 Antennal style; number of elements including terminal spine.
2 Antennal postpedicel; length relative to scape: more than twice as long (1), less than twice as long (2).
3 Antennal scape; predominant colour: blackish (1), yellowish (2).
4 Face; extent of gibbosity: weak (occupies less than half face and juts out weakly) (1), moderate (occupies approximately half face and juts out moderately) (2), strong (occupies more than half face and juts out strongly) (3).
5 Face; width relative to head (i.e. width of head divided by width of face at same level): <7 (relatively broad) (1), >7.5 (relatively narrow) (2).

Thorax:

6 Postpronotal lobe; setal development: short (1), long (2).
7 Mesonotum; development of dorsocentral macrosetae: posterior to, but not reaching level of transverse suture only (1), reach level of transverse suture (2), extend anterior of transverse suture (3).
8 Scutellum; number of marginal macrosetae: 2–3 (1), 4 or more (2).
9 Metathoracic coxa; number lateral macrosetae.
10 Metathoracic femur; colour: blackish (1), areas of black and yellow (2), yellowish (3).

Abdomen:

11 Pruinescence; extent of coverage: first 5 segments (1), 6 segments (2), 7 segments or more (3).
12 Female cerci; dorsal development: finely setose (1), with short macrosetae (2), spinose (3).
13 Aedeagus; more or less straight (apodeme, shaft and prongs lined up) (1), bowed upwards (2), bowed downwards (3), greatly curved (4).
14 Hypandrium; medially well-developed (deep) (1), medially narrowed (2).

9. Metathoracic coxa; number of lateral macrosetae: See comment for character 8 regarding what constitutes a macroseta. When the number is different for the two coxae of a specimen, the higher number is usually the norm.
10. Metathoracic femur; colour: Colour patterns may be rather variable, but in most instances it is easy to assess if they are blackish, yellowish or with patches of these two colours.

Abdomen

11. Pruinescence; extent of coverage: This is an easy character to assess unless specimens are greasy, and even then segments lacking pruinescence appear more glossy than those with pruinescence.
12. Female cerci; dorsal development: Most Asilinae have finely setose cerci. The cerci of *Hoplopheromerus* are clearly spiny, while *Congomochtherus* **has less obvious, short macrosetae (a few species lack them).**
13. Aedeagus; shape: This is not always easy to assess, unless the genitalia have been macerated and dissected. There also appears to be considerable variation within genera, and the value of this character may have to be reassessed when all the genera have been fully revised.
14. Hypandrium; shape medially: Best assessed in ventral view. This is another character which may have to be reassessed when all species have been studied.

Key to genera of Afrotropical Asilinae

Notes:

- This key is provisional as some genera require revision.
- Numbers in superscript refer to similarly numbered notes following the key.
- All new genera are diagnosed later in this paper.
- Use of the character matrix (Table 3) assisted production of the key.

1 Scutellum with more than one pair of marginal macrosetae (i.e. four or more macrosetae present); facial gibbosity well developed; aedeagus strongly curved **Machimus** Loew[1] (= *Dinozabrus* Hull **syn. n**.)

– Scutellum with only one pair of marginal macrosetae (three macrosetae to be counted as one pair); facial gibbosity more moderately developed; aedeagus straight or bowed (*Valiraptor* is exceptional in having a long curved aedeagus) 2

2 Antennal style composed of three elements (small basal segment, long main segment and terminal spine-like tip) 5

– Antennal style composed of two elements (long main segment and terminal spine-like tip – small basal segment not evident) 3

3 Female abdominal segments 1–5 pruinose, 6–10 shiny apruinose and forming a telescopically elongate ovipositor... **Astochia** Becker[2]

– At least female abdominal segments 1–6 pruinose; ovipositor more or less conical 4

4 Mesothoracic femur swollen and with a conspicuous cluster of well-developed macrosetae ventrally; proboscis curved upwards distally; dorsocentral macrosetae do not extend anteriorly to transverse suture; first six abdominal segments of female pruinose, segment seven and beyond shiny apruinose; female cerci equipped with well-developed spinose macrosetae.......................... **Hoplopheromerus** Becker[3]

– Mesothoracic femur not conspicuously swollen and without well-developed macrosetae ventrally; proboscis straight; dorsocentral macrosetae extend anteriorly to transverse suture; first seven abdominal segments of female pruinose, only segment eight and beyond shiny apruinose; female cerci finely setose .... **Heligmonevra** Bigot[4] (= *Cobalomyia* Hull)

5 Postpronotal lobe (and much of mesonotum) covered with uniformly short setae (a few species have setae of intermediate length); metathoracic coxa usually with two macrosetae laterally; epandrium with characteristic subapical dorso-medial lobe (e.g. Fig. 28); aedeagus straight, laterally compressed and with at most tiny distal prongs (e.g. Fig. 42); ovipositor relatively short, only slightly laterally compressed distally .... **Afromochtherus** Lehr[5]

– Postpronotal lobe with fine, long setae; metathoracic coxa usually with one macroseta laterally (*Notomochtherus* has *ca.* three long, weak setae, hardly differentiated from accompanying setae); epandrium and aedeagus differently developed; ovipositor of various forms 6

6 Aedeagal shaft strongly curved and exceptionally long (e.g. Fig. 241), this development giving the terminal abdominal segments a characteristic deep (laterally compressed) appearance; aedeagal prongs exceptionally long and often coiled; hypandrium not markedly constricted medially .... **Valiraptor** gen. n. & ?*Machimus*[6]

– Aedeagal shaft more or less straight to bowed, male terminal abdominal segments tubular and not laterally compressed; hypandrium slightly (*Notomochtherus*) to markedly constricted medially 7

7 Metathoracic femora uniformly dark red-brown to black (proximal or distal end may be paler) 8

– Metathoracic femora chiefly yellow, with or without distinct dark red-brown or blackish marks or bands 10

8 Metathoracic coxa with a single lateral macroseta; aedeagus more of less straight or with a slight curve 9

– Metathoracic coxa with about three weakly developed lateral macrosetae; aedeagus abruptly bent upwards at about midlength (Fig. 178); ovipositor broader than deep (Figs 181–182) .... **Notomochtherus** gen. n.

9 Dorsocentral setae reach transverse suture but do not extend anterior to it; female cerci with short spinose setae dorsally or finely setose with strongly sclerotised, upturned tip; ovipositor conical; aedeagus of characteristic development (shaft more or less straight or slightly sinuous, prongs short and moderately well developed, lateral pair upward directed, median prong downwardly directed, pump distally situated – see Londt & Tsacas (1987) Figs 31 & 38) .... **Congomochtherus** Oldroyd[7]

– Dorsocentral setae extend anterior of transverse suture; female cerci finely setose; ovipositor laterally compressed; aedeagus with characteristic shape (shaft gently bowed, prongs short and weakly developed; pump proximally situated – see Theodor (1976), Fig. 307) .... **Cerdistus** Loew[8]

10 Metathoracic femora almost entirely yellow (may have poorly defined pale brown patches or dark distal ends) 11

– Metathoracic femora with well defined dark red-brown patches or bands (other than dark distal ends) 13

11 Antennal scape blackish; trochanters blackish .... **Caenoura** gen. n.
Note: *Tsacasiella kivuensis* (from Central Africa) keys out here, but the typically elongate male genitalia clearly differentiate it from species of *Caenoura* from Southern Africa.

– Antennal scape yellowish; trochanters yellowish 12

12 Facial gibbosity occupies less than half distance between antennal sockets and epistomal margin, and juts out only weakly; hypopygium greatly elongate, epandrium usually with a small ventrodistal process; gonopods, styli and aedeagus long, narrow and relatively straight (e.g. Figs 205–207)........... **Tsacasiella** Lehr[9]

– Facial gibbosity occupies about half distance between antennal sockets and epistomal margin, and juts out moderately; hypopygium not greatly elongate, epandrium with a dorsomedial process, gonopods not markedly elongate, styli elongate and much longer than gonopods, aedeagal shaft downwardly curved distally, prongs minute (e.g. Figs 185–189) .... **Sphagomyia** gen. n.

13 Male S8 with a prominent distomedial process (Fig. 148) .... **Gongromyia** gen. n.

– Male S8 lacking a prominent distomedial process 14

14 Antennal postpedicel at least twice length of scape; epandrium characteristically shaped (Figs 140–142), shortish and converging strongly distally; aedeagus bent abruptly upwards at about midlength and with three short, well developed terminal prongs (Fig. 143) ....**Dikowmyia** gen. n.

– Antennal postpedicel less than twice length of scape 15

15 Epandrium with complicated arrangement of lobes and processes distally (e.g. Figs 119–121); ovipositor shortish, broad proximally, laterally compressed distally .... **Aneomochtherus** Lehr[10]

– Epandrium of simple structure, totally lacking lobes and processes (e.g. Fig. 166); ovipositor longish, laterally compressed for most of length.................................. **Melouromyia** gen. n.

Taxonomic notes:

1 *Machimus* Loew, 1849: 1 (as subgenus of *Asilus*). Type-species: *Asilus chrysitis* Meigen, 1820, by designation of Coquillett (1910: 564). *Tolmerus* Loew, 1849: 94 is a listed synonym (Oldroyd 1980). Oldroyd (1980) lists 11 valid afrotropical species and one synonym. Most of the species are East African in distribution. The genus requires revision. It is probable that a number of species are digeneric (i.e. not congeneric) (see note 6) and that many undescribed species exist.

2 *Astochia* Becker, 1913: 538. Type-species: *Astochia metatarsata* Becker, 1913, by monotypy. The five afrotropical species were reviewed by Londt (1982). Species are known from South, East, Central and West Africa as well as from the Arabian Peninsula. It is suspected that the genus is polyphyletic. Additional figures of male genitalia (*Astochia armata* (Becker, 1909)) are provided (Figs 6–8).

3 *Hoplopheromerus* Becker, 1925: 241. Type-species: *Asilus armatipes* Macquart, 1855, by designation of Hull (1962: 539). Five species were reviewed by Tsacas & Oldroyd (1967) and are found in Central and West African forests. New illustrations of male genitalia (*Hoplopheromerus podagricus* (Bezzi, 1914)) are provided (Figs 15–20).

4 *Heligmonevra* Bigot, 1858: 356. Type-species: *Heligmonevra modesta* Bigot, 1858, by monotypy. *Cinadus* Wulp, 1898 is a listed synonym and the spelling *Heligmoneura* is considered incorrect (Oldroyd 1980). Oldroyd (1980) catalogued 26 species; 15 from Madagascar (reviewed by Martin, 1964). The African species require revision. New illustrations of male genitalia (*Heligmonevra laevis* Engel, 1927) are provided for comparative purposes (Figs 21–25).

5 *Afromochtherus* Lehr, 1996: 71. Type-species: *Neomochtherus atrox* Tsacas, 1969, by original designation (not *atrax* as cited by Lehr). Lehr included 4 species in the genus (*atrox* Tsacas, 1969, *genialis* Tsacas, 1969, *mendax* Tsacas, 1969, *unctus* Oldroyd, 1939), all afrotropical and previously assigned to *Neomochtherus*. The genus is reviewed in this paper.

6 ?*Machimus*. Most of the specimens in the Natal Museum, assigned (probably tentatively) to *Machimus* by Oldroyd or Tsacas, key out as *Valiraptor*. All have only a pair of scutellar macrosetae and the facial protuberance less developed than in more typical *Machimus* species (palaearctic taxa and a few afrotropical species). These digeneric species differ from *Valiraptor* in being predominantly blackish (with strong silvery or golden pruinescence, particularly on the mesonotum), and having an aedeagal form more like typical *Machimus* species (see Theodor's (1976) Fig. 231). The afrotropical *Machimus* 'complex' is clearly polyphyletic and requires taxonomic review.

7 *Congomochtherus* Oldroyd, 1970: 305. Type-species: *Congomochtherus lobatus* Oldroyd, 1970, by original designation. Confined to the Afrotropics and revised by Londt & Tsacas (1987). There are seven described species from South, Central and East Africa, all apparently closely associated with rocky streams.

8 *Cerdistus* Loew, 1849: 74 (as subgenus of *Asilus*). Type-species: *Asilus erythrurus* Meigen, 1820, by designation of Engel (1927: 92). There is only one afrotropical species (*unicus* Becker, 1910: 137) from South Yemen and Socotra. I have not seen material of this species, but have examples of *C. geniculatus* (Meigen, 1820), identified by Dr Hradsky. This species has been listed under *Paritamus* Verrall, 1909 (Lehr 1988). Clearly, a re-examination of Becker's material is necessary before it can be stated with certainty that *Cerdistus* is found in the Afrotropics. For comparative purposes, Theodor's (1976) illustration (Fig. 307) of the aedeagus of the type-species should be consulted.

9 *Tsacasiella* Lehr, 1996: 72. Type-species: *Heligmonevra neavei* Ricardo, 1919, by original designation. Lehr elevated Tsacas' (1969) *N. neavei* species group to that of a genus. The genus, largely restricted to Central Africa, is recognised as valid and treated in this paper.

10 *Aneomochtherus* Lehr, 1996: 75. Type-species: *Neomochtherus micrasiaticus* Tsacas, 1968, by original designation. The afrotropical species assigned by Lehr (1996) to this chiefly palaearctic genus are treated in this paper. These species are East African in distribution.

Taxonomy of afrotropical *Neomochtherus* (*sensu* Tsacas, 1969)

This section contains accounts of the genera which have been proposed by Lehr (1996) for species groups defined by Tsacas (1969), and descriptions of new genera based on species which would probably have been assigned to *Neomochtherus* by Tsacas.

The only previously described species handled in this review are those catalogued by Oldroyd (1980) as *Neomochtherus*. The only catalogued species not covered are *arabicus*, *nudus* and *rothkirchii* (briefly mentioned earlier), for the following reasons:

Asilus arabicus Macquart, 1838. This species was placed in *Heligmonevra* by Kertész (1909) and subsequently included by Tsacas (1968) in his treatment of the palaearctic *Neomochtherus* fauna. I do not know why Oldroyd (1980) listed the species as afrotropical, but assume that he knew of material from this region. The unique holotype, of unrecorded sex, is preserved in MNHN. Apart from transferring the species to *Aneomochtherus*, Lehr (1996) had nothing more to contribute to our knowledge of the taxon. For the present I consider the species to be palaearctic and therefore have not included it in my study.

Heligmonevra nudus Bezzi, 1906. This species was described on male material from 'Dintorni di Adi Caiè', Eritrea (Ethiopia), collected by Andreini in June 1902. The type is apparently housed in the Zoological Museum, Florence, Italy. The species was listed by Oldroyd (1980) both under *Heligmonevra* and *Neomochtherus*. Although the listing under *Neomochtherus* suggests that Oldroyd had reason to believe that the species should be moved to this genus, there is no comment to support such an action. I have not studied the type and so have excluded the species. Bezzi's description, in Latin and Italian, suggests that the species may not be a true *Heligmonevra*, as the male genitalia are described as acute ('genitalibus parvis acutis') and therefore unlike more typical *Heligmonevra* males. There is also a possibility that the species could be assigned to *Ommatius*, as suggested by Bezzi, who says that none of the specimens available has an intact antennal style (one of the main features of *Ommatius* being a 'feathered' style).

Heligmonevra rothkirchii Speiser, 1913. This species was described on one female specimen from 'Duala', Cameroun, collected in October 1912. I do not know its whereabouts. This species is also listed by Oldroyd (1980) both under *Heligmonevra* and *Neomochtherus* (above comments for *nudus* apply). Speiser's description, in German, is rather generalised and does not appear to provide features that are truly diagnostic of the genus. Some characters suggest that the species is neither a *Heligmonevra* nor a *Neomochtherus* (*sensu* Oldroyd). For example, the sides of the abdomen have long yellow setae ('Behaarung des Abdomens geld, an den Seiten lang ...'). The taxonomic position of this species remains uncertain and study of the type material is required.

Character matrix

Comments on the characters used in the construction of a character matrix (Table 4) follow, numbers being the same as in the Table.

Antenna

1 Scape & Pedicel coloration: Some variation exists, but in most cases it is not difficult to establish the general coloration of these segments. Teneral specimens may be paler than those with complete sclerotisation. The term 'blackish' covers all shades of dark red-brown while 'yellowish' covers much paler colours ranging from pale yellow to brownish yellow.

2 Postpedicel and stylus; relative lengths: This is easy to measure although it may be necessary to measure curved styli with care. Only one species (*kolodrilus*) appeared

Table 4

Character matrix used in the study of species included in this paper.

	Character																			
Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Afromochtherus																				
anatolicus	1	2	2	2	3	1	2	1	1	1	1	1	2	2	2	1	1	3	2	2
astiptus	2	2	2	2	3	1	2	1	1	2	-	-	3	2	3	2	1	3	2	2
atrox	2–3	?	2?	2?	3	1	1	1	1	?	-	-	1	2	2	1	1–2	3	2	2
kolodrilus	1	3	1	2	2	1	2	1	1	2–3	1	1	3	2?	2	1	1	1	2	2
malawi	1	2	2	2	3	2	2	1	2	1	1	1	2	1	3	1	1	3	2	2
megastylus	1	2	2	2	4	1	2	1	2	3	1	1	1	2	3	1	1	3	2	2
melanurus	2–3	2	2	2	3	2	2–3	1	2	1–2	1	1	2	2	3	1	1	3	2	2
mendax	1	2	2	2	4	1	2–3	1	3	1–2	1	1	1	2	2	1	1	3	2	2
mkomazi	2	2	1–2	2	3	1	1	1	2	1–2	1	1	1	1	3	1	1	3	2	2
peri	1	2	2	2	3	2	2	1	2	1	1	1	2	2	3	1	1	3	2	2
sathus	1	2	2	2	3	2	2	1	2	1	1	1	2	1	3	1	1	3	2	2
unctus	1–3	2	1	2	3	1	1–2	1	1–3	2–3	-	-	2	1–2	3	1	1	3	2	2
zoropegus	2–3	1	2	2	3	2	2–3	1	2	1	1	1	2	2?	3	1	1	3	2	2
Aneomochtherus																				
africanus	3	2	1	1	2	1	1	2	2	2–3	2	2	3	1	3	2	1	1	2	5
deserticolus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
monobia	3	2	1	1	2	1	1–2	2	2	2	2	2	3	2	3	2	1	1	2	5
Caenoura																				
annulitarsis	3	1	1	1	1	1	1	2	1	3	1	1	2	2	3	2	1	1	2	3
sinuatus	3	1	1	1	3	1	1	2	1	1	1	1	3	2	3	2	2	1	2	3
Dikowmyia																				
mediorus	3	1	1	1	1	1	1	2	2	2	1	1	2	1–2	2	2	2	2	2	4
Gongromyia																				
bulla	3	1	1	1	1	1	1	2	2	3	1	1	2	2	3	2	2	2	2	3
Melouromyia																				
diaphorus	3	2	1	1	2	1	1	2	2	1	2	2	3	1	1	2	1	1	2	1
natalensis	3	2	1	1	3	1	1	2	2	1	2	2	4	1–2	2	2	1	1	2	1
Notomochtherus																				
brevicauda	3	1	1	1	2	1	2	2	3	3	1	1	2	1	1	2	2	1	2	4
Sphagomyia																				
botswana	1	2	1	2	3	1	1	1	1	1	1	2	1	1	3	3	1	3	2	2
kenya	3	2	1	2	3	1	1	1	2	2	1	1	1	1	3	3	1	3	2	2

Tsacasiella																				
*blanda***	?	2	1	1–2	1	1	1	1	1	1	-	-	4	1	1–2	3	1	1?	2	3
*debilis***	?	2	1	1	1	?	1	1	?	?	-	-	4	1	2	3	1	1?	2	3
*exilis***	?	2	1	1	1	?	1	1	?	?	-	-	3	1	2	2–3	1	1?	2	3
futilis	1	2	1	1	3	1	1	1	1	1	2	2	3–4	1	2	3	1	1–3	2	3
inornata	1	2	1	1	3	1	1	1	2	1	2	2	3	1	2	2	1	1	2	3
instabilis	2	2	1	1	1	1	1	1	1	1	1	2	3–4	1	1	3	1	1–3	2	3
*kivuensis***	3	2	1	1	1	1	1	2	2	1	2*	2*	4	1	2	3	1	3	2	3
*neavii***	1	2	1	1	2	1	1	1	1	1	2*	2*	4	1	1	3	1	1?	2	3
Valiraptor																				
montanus	3	1	1	1	2	1	1	2	2	3	1	1	4	1	1	3	3	3	1	1
namibiensis	1	3	1	2	3	1	1	1	1	3	-	-	4	1	1	3	3	3	1	1
silvestris	3	1	1	1	1	1	1	1	2	2	2	2	4	1–2	1	3	3	3	1	1
vittatus	1	1	1	2	3	1	1	1	1	1	-	-	4	1	1	2	3	1	1	1

* = genitalia not cleared for measurement; ** = Types damaged, Tsacas' text and illustrations also used; - = No data available; ? = uncertainty exists.

Character states:

Antenna
1 Scape & Pedicel coloration: Both segments yellowish (1), scape blackish, pedicel mostly yellowish (2), both segments blackish, pedicel with at most a narrow yellowish apex (3).
2 Postpedicel and stylus; relative lengths: Postpedicel longer than stylus (1), shorter (2), subequal (3).

Dorsal thoracic macrosetae
3 Postpronotal lobe; setal condition: Long (1) or short (2).
4 Dorsocentrals; position relative to transverse suture: At least a few pairs present anterior to transverse suture (1), present from about level of suture and posterior to it (2).

Wing
5 Microtrichial coverage: Entire wing (1), fairly extensive in distal area (cell r_5 entirely covered) (2), moderate in distal area (proximal tip of cell r_5 bare) (3); limited to wing margins (much of cell r_5 bare) (4).

Prothoracic legs
6 Femur; posteroventral setae: Long, fine hair-like setae only (1), 2–3 shortish macrosetae present (2).

Metathoracic legs
7 Coxa; number of lateral macrosetae: 1 to 3 (most common condition).
8 Trochanter; colour: Yellow – Brownish (1) or Dark Redbrown – Black (2).
9 Femur; anterior colour: Entirely yellowish or brownish (slightly darker ends) (1), yellow with brown-black markings (2), entirely blackish (slightly paler ends) (3).
10 Femur; anterior macrosetae colour: Dark redbrown to black (1), black & yellow/white (2), yellow/white (3).

Ovipositor
11 Length:width ratio (measured dorsally): <3.3 (1) relatively short and broad, > 3.3 (2) relatively long and narrow.
12 Length:depth ratio (measured laterally): <2.8 (1) relatively short and deep; > 2.8 (2) relatively long and shallow.

Male postabdomen
13 Hypopygium; gonocoxite; length:width ratio: < 1.6 (1), 1.6 – 2.0 (2), 2.1 – 2.5 (3), > 2.5 (4).
14 S8; condition of distal margin: Lacking medial process or sclerotised area (1), with median process or sclerotised area (2).
15 Hypandrium; ventromedial area; degree of medial constriction: Not markedly constructed (1), moderately constricted (ca. Half width of lateral parts) (2), greatly constricted (ca. Quarter width of lateral parts) (3).
16 Hypopygium; gonostylus shape (viewed ventrally): Distally clubbed (1), moderately slender (2), clearly attenuate (3).
17 Hypopygium; aedeagal terminal filaments: Not obvious or short and poorly developed (1); moderately well developed, trifurcate or five-pointed (2), well developed and usually filimentous (3).
18 Hypopygium; gonostylus length relative to gonocoxite (viewed ventrally): Shorter (1), subequal (2), longer (3).
19 Hypopygium; aedeagal shape: Strongly curved, greatly elongate, tubular (1), straight, relatively short, laterally compressed (2).
20 Hypopygium; epandrium shape: Simple (without obvious lobes or projections) (1), with dorsal process/lobe (2), with ventral, subapical process (3), distally bilobed (4), with complex arrangement of lobes and projections distally (5).

to have these antennal parts of identical measurement; with the discovery of more material this may be found incorrect.

Dorsal thoracic macrosetae

3 Postpronotal lobe; setal condition: It is usually easy to determine if a specimen has long, fine setae or shorter, rather stubby setae. In some instances setae may vary in length; if there are some longish ones present the setae are described as long. In one instance (*mkomazi*) variation prompted me to indicate a variable condition. The short-setae state of this character is confined to *Afromochtherus*, a group found largely in southern Africa, and it is interesting to note that species from further north (i.e. *mkomazi* and *unctus*) have setae that may be characterised as long.

4 Dorsocentrals; position relative to transverse suture: Dorsocentrals are present in all the species and occur posterior to the transverse suture. The most anterior setae are usually shorter and thinner than the posterior ones. It is, therefore, not always easy to decide if dorsocentrals occur anterior to the suture. To add to the problem, it is in this area that the pin is usually inserted through the specimen, and so some damage may be encountered. Where setae have been rubbed off it is usually possible to see their sockets and in this way decide if there are dorsocentrals anterior to the suture.

Wing

5 Microtrichial coverage: Provided wings are clean it is usually easy to see the distribution of microtrichia. If the wing is viewed against a brightly-lit background, patterns are easier to see. A little variation can be expected, but on the whole the character states used can be easily identified. It is not always easy to see the microtrichia in the narrow subcostal cell, so the wing illustrations given in this paper may not be accurate in this regard.

Prothoracic legs

6 Femur, posteroventral setae: Most species have fine, longish setae on the posteroventral parts of the prothoracic femora. There are, however a few species of *Afromochtherus* which have some relatively short macrosetae which are clearly differentiated from adjacent fine, long setae. It is always easy to see if these macrosetae are present.

Metathoracic legs

7 Coxa; number of lateral macrosetae: These can usually be easily discerned although in a few cases care needs to be taken. They usually have clearly evident sockets. Some variation may exist, and where there are a number of specimens available the most common number should be used.

8 Trochanter; colour: The colour can usually be easily determined. In some cases the base of the trochanter (where it joins the coxa) may be much darker – in such cases the dominant colour is used. All *Afromochtherus* have yellowish brown trochanters, while all other species except two have blackish trochanters.

9 Femur; anterior colour: In most instances it is easy to determine the colour. However, when there are brownish markings it may become more difficult. Markings that are very pale are considered absent. The extent of brownish markings appears rather variable and so no attempt has been made to describe the extent of such markings (as was done by Tsacas (1969)). A number of species with yellowish femora may

have the distal ends fairly broadly brownish; this condition has been ignored when determining the colour of the femur.

10 Femur; anterior macrosetae colour: These setae may all be dark red-brown to black, all yellowish, or a mixture of colours. Some variation exists and so these particular character states may not be all that useful.

Ovipositor

11 Length:width (i.e. length divided by width) ratio (measured dorsally): Ideally measurements should be taken of cleared genitalia, but measurements of dry specimens do not depart greatly from macerated ones.

12 Length:depth ratio (measured laterally): See comment for character 11.

Male postabdomen

13 Hypopygium; gonocoxite: length:width ratio: It is essential to macerate the genitalia so that the entire gonocoxite can be seen. Measurements were made of illustrated gonocoxites as follows – a line was drawn from the distal tip of the gonocoxite to its base at the point which was furthest from the tip (i.e. along axis of maximum length). Maximum width was the greatest width when measured at a right angle to the line representing the maximum length.

14 S8; condition of distal margin: It is essential to macerate genitalia before trying to assess the presence or absence of a medial process or sclerotised area. These processes or sclerotised areas may take a variety of forms, and it will be necessary to study my illustrations to appreciate my concept of these structures.

15 Hypandrium (S9); ventromedial area; degree of medial constriction: It is essential to macerate samples and to extend the segments to reveal the shape of the hypandrium. It is not necessary to separate all the segments through dissection and to flatten the hypandrium (as was obviously done by Tsacas (1969)) in order to determine the extent of a median constriction.

16 Hypopygium; gonostylus shape (viewed ventrally): The gonostylus may be of complex structure; however, when viewed ventrally it is usually obvious if it is distally clubbed. A number of species (i.e. *Tsacasiella* and *Valiraptor*) have long, thin styli that are clearly not clubbed. Anything between these conditions is described as ‘moderately slender’.

17 Hypopygium; aedeagal terminal filaments: The condition of these filaments (elongated prongs) can usually be seen even in dry specimens. However, details can only be fully appreciated when samples have been macerated. As there is specific variation, the character states used here are broad generalisations.

18 Hypopygium; gonostylus length relative to gonocoxite (viewed ventrally): These structures were not measured, but merely viewed ventrally to see which organs jutted out furthest.

19 Hypopygium; aedeagal shape: Species of *Valiraptor* have a greatly elongated aedeagus quite unlike all the other species studied here, but somewhat similar to species of genera such as *Machimus* which are still in need of revision.

20 Hypopygium; epandrium shape: Species can be grouped according to the epandrial shape and most of these groups are here considered as genera. The character states used in the matrix are best appreciated by studying illustrations. In most instances it is easy to determine the appropriate character state.

Afromochtherus Lehr, 1996.

Afromochtherus Lehr, 1996: 71. Type-species: *Neomochtherus atrox* Tsacas, 1969, by original designation (not *atrax* as cited by Lehr).

Diagnosis: *Head*: Antennal style composed of three elements including terminal spine; postpedicel less than twice as long as scape; scape predominantly yellowish. Facial gibbosity moderately well developed, occupying approximately half distance between lower facial margin and antennal sockets. Face relatively broad (width of head divided by width of face at same level <7). *Thorax*: Postpronotal lobe usually equipped with uniformly short setae. Mesonotum with dorsocentral macrosetae posterior to transverse suture only. Scutellum usually with two marginal macrosetae. Metathoracic coxa usually with two lateral macrosetae. Metathoracic femur with areas of black and yellow. *Abdomen*: Pruinescence extends uniformly over at least seven segments. Female cerci dorsally finely setose; ovipositor relatively short and only slightly laterally compressed distally. Epandrium with subapical, dorsomedial lobe. Aedeagus more or less straight, laterally compressed and with tiny distal prongs. Hypandrium medially narrowed.

Note: See also illustrations, key and character matrix (Table 3) for morphological information.

Key to species of *Afromochtherus* Lehr, 1996.

Note: See character matrix (Table 4) for additional morphological information.

1 Prothoracic femur with 2–3 shortish, well developed macrosetae posteroventrally. 2

– Prothoracic femur lacking well-developed shortish macrosetae posteroventrally, but with long, fine setae of varying development only 6

2 Antennal scape yellow 3

– Antennal scape dark red-brown 5

3 Genitalia as illustrated (Figs 47–49) .... **malawi** sp. n.

– Genitalia of another form 4

4 Genitalia as illustrated (Figs 82–84) .... **peri** sp. n.

– Genitalia as illustrated (Figs 89–92) .... **sathus** sp. n.

5 Genitalia as illustrated (Figs 105–107) .... **zoropegus** sp. n.

– Genitalia as illustrated (Figs 61–63) .... **melanurus** sp. n.

6 Microtrichia coverage of wing membrane such that entire cell r_5 is covered. Male genitalia as illustrated (Figs 40–42) .... **kolodrillus** sp. n.

– Microtrichia coverage of wing membrane less extensive such that at least the posterior part of cell r_5 is without microtrichia 7

7 Microtrichia of wing absent from only a small proximal area of r_5 9

– Microtrichia of wing absent from a much bigger area of r_5 such that about one-third of the cell is bare 8

8 Anterior face of metathoracic femur dark red-brown to black, with black (sometimes a few yellowish) macrosetae; scape and pedicel usually with at least a few black setae; male genitalia as illustrated (Figs 68–70) .... **mendax** Tsacas, 1969.

– Anterior face of metathoracic femur largely yellowish (with a pale narrow darker longitudinal band), with yellow macrosetae; scape and pedicel with white setae only; male genitalia as illustrated (Figs 54–56) .... **megastylus** sp. n.

9 Anterior face of metathoracic femur largely yellowish (only tip darker brown); male genitalia as illustrated (Figs 35–37) .... **astiptus** sp. n.

– Anterior face of metathoracic femur largely brownish 10

10 Male epandrium well-developed and rather bulbous (almost as wide as long in dorsal view), lobes distally turned sharply inwards towards each other and tips touching; male genitalia as illustrated (Figs 75–77) .... **mkomazi** sp. n.

– Male epandrium of more usual development and not particularly bulbous (clearly longer than wide in dorsal view), lobes more or less straight or slightly inwardly directed (tips not touching) 11

11 Dorsal projection of epandrial lobe large and almost equal in size to distal projection; male genitalia as illustrated (Figs 28–30). .... **anatolicus** sp. n.

– Dorsal projection of epandrial lobe much smaller than distal projection (not as well developed) 12

12 Genitalia as illustrated (Figs 97–100) .... **unctus** Oldroyd, 1939

– Genitalia as illustrated (Tsacas (1969), Figs 11–18) .... **atrox** Tsacas, 1969

Note: At the time he undertook his revision of *Neomochtherus*, Tsacas (1969) had at his disposal very few specimens from southern Africa. It is now clear that *Afromochtherus* is a speciose genus with a primarily southern African distribution.

Afromochtherus anatolicus sp. n. (Figs 26–32)

Etymology: Gr. *anatolikos* – eastern. Refers to the eastern distribution of the species.

Diagnosis: *Head*: Antennal scape and pedicel yellowish; postpedicel shorter than stylus. *Thorax*: Postpronotal lobe equipped with short setae. Dorsocentrals not extending anterior of transverse suture. Wing with moderate microtrichial coverage limited to distal areas (proximal tip of cell r_5 bare). Prothoracic femur with long, fine, hair-like posteroventral setae. Metathoracic coxa with two lateral macrosetae; trochanter brownish yellow; femur extensively brownish yellow anteriorly with dark red-brown to black macrosetae. *Abdomen*: Ovipositor relatively short and broad (length:width ratio, measured dorsally, <3.3) and relatively short and deep (length:depth ratio, measured laterally, <2.8). Hypopygium: Gonocoxite length:width ratio 1.6–2.0. Distal margin of S8 with rounded median process. Ventromedial area of hypandrium moderately constricted (i.e. *ca.* half width of lateral parts). Gonostylus, viewed ventrally, distally clubbed. Aedeagal terminal filaments short and poorly developed. Gonostylus longer than gonocoxite (viewed ventrally). Aedeagus straight, relatively short and laterally compressed. Epandrium with dorsal lobe large and almost equal in size to distal projection.

Material examined: **Holotype**: SOUTH AFRICA: 1♂, 'South Africa. Transvaal / Kruger Park 2331DC / Letaba Camp xii-1972 / on tree trunks / Stuckenberg family'. **Paratypes**: SOUTH AFRICA: 1♂ 1♀ , 'S. Africa: Transvaal / 30km W. Hoedspruit [24°21'S:30°58'E] / 27.xi.1978 / Brothers & J.-Guillarmod'.

Type locality: South Africa, Kruger Park, Letaba Camp.

Comments: A species with similarity to *unctus* and to *mendax*. The male genitalia are fairly similar to those of *mendax*, but show differences, particularly in the shape of the epandrial lobes (lateral aspect) and gonostylus (ventral aspect). The species is recorded only from the lowveld of the Limpopo Province of South Africa.

Afromochtherus astiptus sp. n. (Figs 33–37)

Etymology: Gr. *astiptos* – desert. Refers to the arid area in which the species was collected.

Diagnosis: *Head*: Antennal scape blackish, pedicel mostly yellowish; postpedicel shorter than stylus. *Thorax*: Postpronotal lobe equipped with short setae. Dorsocentrals posterior to transverse suture only. Microtrichial coverage of wing largely confined to distal and posterior parts (proximal tip of cell r_5 bare). Prothoracic femur with long, fine, hair-like posteroventral setae. Metathoracic coxa with two lateral macrosetae; trochanter brownish yellow; femur largely yellowish anteriorly (distal end darker) and with both blackish and yellowish macrosetae. *Abdomen*: Gonocoxite length:width ratio between 2.1–2.5. Distal margin of S8 with pointed median process. Hypandrium with ventromedial area greatly constricted (*ca*. quarter width of lateral parts). Gonostylus moderately slender (viewed ventrally). Aedeagal terminal filaments tiny, poorly developed. Gonostylus longer than gonocoxite (viewed ventrally). Aedeagus straight, relatively short and laterally compressed. Epandrium with dorsal process/lobe.

Material examined: **Holotype**: NAMIBIA: 1♂, 'Aar 16 / Luderitz / SE 2616Da / 5 Mar. 1972', 'H7280' (NMNW).

Type locality: Namibia, Luderitz, Aar 16 [farm].

Comments: A species based on a single male specimen, in fair condition, collected near Luderitz. The male genitalia are similar to a few other species in the genus, but differ, particularly in the shape of the epandrium (dorsal aspect), gonocoxite and gonostylus (ventral aspect). The female is unknown.

Afromochtherus atrox (Tsacas, 1969)

Neomochtherus atrox Tsacas, 1969: 9–11.
Afromochtherus atrax [sic]; Lehr, 1996: 72.

Type material: **Holotype**: DR CONGO: 1♂ [seen], 'Musée du Congo, / Lulua [05°56'S:25°47'E] – Kasai / 1928 / Dr Walker' (MRAC); **Paratypes**: DR CONGO: 1♂ **paratype** [not seen], Lulua, Kasai, Riv. Luele, 1928, Dr Walker (MNHN); 1♂ **paratype** [not seen], Elizabethville [11°40'S:27°28'E], Miss. Agric. (MRAC).

Type locality: Democratic Republic of the Congo, Lulua.

Comments: No additional material has been seen. For illustrations of the genitalia see Tsacas' (1969) illustrations (Figs 11–15 – ♂, Figs 16–17 – ♀). The species, known only from DR Congo, is similar to *unctus*, but displays clear differences in the shape of the male genitalia. Female unknown.

Afromochtherus kolodrilus sp. n. (Figs 38–44)

Etymology: Gr. *kolos* – shortened + *drilos* – penis, refers to the relatively short aedeagus of this species.

Diagnosis: *Head*: Antennal scape and pedicel yellowish; postpedicel and stylus of similar length. *Thorax*: Postpronotal lobe with longish setae. Dorsocentrals posterior to transverse suture only. Wing with extensive microtrichial coverage (cell r_5 entirely covered). Prothoracic femur with long, fine, hair-like posteroventral setae. Metathoracic coxa with two lateral macrosetae; trochanter brownish yellow; femur entirely brownish yellow anteriorly and with anterior macrosetae mostly yellow/white (a few blackish ones may be present). *Abdomen*: Ovipositor relatively short and broad (length:width ratio, measured dorsally <3.3) and relatively short and deep (length:depth ratio, measured laterally – <2.8). Gonocoxite length:width ratio 2.1–2.5. Distal margin of S8 with weakly developed sclerotised area. Hypandrium with ventromedial area moderately constricted (*ca*. half width of lateral parts). Gonostylus distally clubbed (viewed ventrally). Aedeagal terminal filaments very small and poorly developed. Gonostylus shorter than gonocoxite (viewed ventrally). Aedeagus straight, relatively short and laterally compressed. Epandrium with dorsal process/lobe.

Material examined: **Holotype**: SOUTH AFRICA: 1♂, 'Sth Africa: Cape Prov / Graaff-Reinet / Valley of Desolation / 32°17'S:24°28'E / JGH Londt 5.xii.1988 / Montane macchia vegit'. **Paratypes**: SOUTH AFRICA: 2♀, same data as holotype; 1♀ 'Sth Africa: Cape Prov / Karoo Nature Reserve / West of Graaff Reinet / 32°16'S:24°30'E 1325m / J&H Londt 8.xii.1989 / nr. Desolation valley'.

Type locality: South Africa, Eastern Cape, Graaff-Reinet, Valley of Desolation.

Comments: Apart from the species having wings with more extensive microtrichial coverage than other species in the genus, male genital structure is difficult to confuse with congeners. Known only from the type locality in the Little & Great Karoo climatic region or southern Africa (Fig. 249). Although *mendax* is known to occur not far from the type locality of *kolodrilus*, these species are not easily confused.

Afromochtherus malawi sp. n. (Figs 45–51)

Etymology: Named after the country of Malawi.

Diagnosis: *Head*: Antennal scape and pedicel yellowish; postpedicel shorter than stylus. *Thorax*: Postpronotal lobe with short setae. Dorsocentrals posterior to transverse suture only. Microtrichial coverage moderate, confined to distal and posterior parts of wing (proximal tip of cell r_5 bare). Prothoracic femur with two or three shortish posteroventral macrosetae. Metathoracic coxa with two lateral macrosetae; trochanter brownish yellow; femur yellow with brown-black markings anteriorly and with dark red-brown to black macrosetae. *Abdomen*: Ovipositor relatively short and broad (length:width ratio, measured dorsally <3.3) and relatively short and deep (length:depth ratio, measured laterally <2.8). Gonocoxite length:width ratio 1.6–2.0. Distal margin of S8 lacking median process or sclerotised area. Hypandrium with ventromedial area greatly constricted (*ca*. one quarter width of lateral parts). Gonostylus distally clubbed (viewed ventrally). Aedeagal terminal filaments tiny, poorly developed. Gonostylus longer than gonocoxite (viewed ventrally). Aedeagus straight, relatively short and laterally compressed. Epandrium with dorsal process/lobe.

Material examined: **Holotype**: MALAWI: 1♂, 'Malawi 35km SE of / Monkey Bay on road / to Mangochi 1434Aa / 12.xii.1980 500m / Londt & Stuckenberg / mixed woodland'. **Paratypes**: MALAWI: 1♂ 1♀, same data as holotype.

Type locality: Malawi, 35 km S.E. Monkey Bay.

Comments: Most similar to *peri* and *sathus*, but easily distinguished using male genital characters. Known only from the type locality.

Afromochtherus megastylus sp. n. (Figs 52–58)

Etymology: Gr. *mega* – large + *stylus*. Refers to large gonostylus.
Diagnosis: *Head*: Antennal scape and pedicel yellowish; postpedicel shorter than stylus. *Thorax*: Postpronotal lobe with short setae. Dorsocentrals posterior to transverse suture only. Microtrichial coverage of wing limited to wing margins (much of cell r_5 bare). Prothoracic femur with long, fine, hair-like posteroventral setae. Metathoracic coxa with two lateral macrosetae; trochanter brownish yellow; femur anteriorly largely yellow with pale brownish, narrow, longitudinal band and with yellow/white macrosetae. *Abdomen*: Ovipositor relatively short and broad (length:width ratio, measured dorsally <3.3) and relatively short and deep (length:depth ratio, measured laterally <2.8). Gonocoxite length:width ratio <1.6. Distal margin of S8 with median sclerotised area. Ventromedial area of hypandrium greatly constricted (*ca*. one quarter width of lateral parts). Gonostylus distally clubbed (viewed ventrally). Aedeagal terminal filaments short and poorly developed. Gonostylus longer than gonocoxite (viewed ventrally). Aedeagus straight, relatively short and laterally compressed. Epandrium with dorsal process/lobe.
Material examined: **Holotype**: NAMIBIA: 1♂, 'NA99-MO5: / Namibia: Brandberg / Wasserfallfläche 1960m / 21°10·77'S 14°32·87'E / 07–10 iv 1999 S. van Noort & / S.G. Compton Malaise trap Eell / vegetated valley below waterfall, / Bushy Karoo-Namib scrubland' (NMNW). **Paratypes**: NAMIBIA: 1♀, same data as holotype; 1♂, 'NA99-MO4: / Namibia: Brandberg / Hungorob Valley 1180m / 21°11·40'S 14°31·59E / 02–05 iv 1999 S. Van Noort & S.G. Compton Malaise trap / Bushy Karoo-Namib shrubland; 1♂, 'NA99-MO4: / Namibia: Brandberg / Hungorob Valley 1180m / 21°11·40'S 14°31·59E / 05–16 iv 1999 S. Van Noort & S.G. Compton Malaise trap / Bushy Karoo-Namib shrubland (NMNW).
Type locality: Namibia, Brandberg Mountain.
Comments: Male genitalia similar to some other congeners, but the rather elongate gonostyli are unique. Known only from two closely-situated localities on the Brandberg mountains (Fig. 249), which lies in the Desert and Poor Steppe climatic region. Although *mendax* probably occurs nearby, these species are readily distinguishable.

Afromochtherus melanurus sp. n. (Figs 59–65)

Etymology: Gr. *melan* – black + *oura* – tail, refers to black hypopygium.
Diagnosis: *Head*: Antennal scape blackish, pedicel yellowish, but may be dark red-brown proximally; postpedicel shorter than stylus. *Thorax*: Postpronotal lobe with short setae. Dorsocentrals present posterior to transverse suture only. Microtrichial coverage of wing moderate in distal area (proximal tip of cell r_5 bare). Prothoracic femur with two or three shortish posteroventral macrosetae. Metathoracic coxa with two or three lateral macrosetae; trochanter brownish yellow; femur anteriorly yellow with brown-black markings and anterior macrosetae mostly dark red-brown to black, although a few yellow/white setae may be present. *Abdomen*: Ovipositor relatively short and broad (length:width ratio, measured dorsally <3.3) and relatively short and deep (length:depth ratio, measured laterally <2.8). Gonocoxite length:width ratio 1.6–2.0. Distal margin of S8 with rounded median process. Ventromedial area of hypandrium greatly constricted (*ca*. one quarter width of lateral parts). Gonostylus distally clubbed (viewed ventrally).

Aedeagal terminal filaments minute. Gonostylus longer than gonocoxite (viewed ventrally). Aedeagus straight, relatively short and laterally compressed. Epandrium with dorsal process/lobe.

Material examined: **Holotype**: SOUTH AFRICA: 1♂, 'Matatiele / E Griqualand / 6.1.1969 3028BD / T.W. Schofield'. **Paratypes**: SOUTH AFRICA: 1♀, 'Beaufort West / Oukloof [32°10'S:21°45'E] / C.P.' ~ 'Zinn – Hesse / Mus. Exp. / Jan. 1949' (SAMC); 1♂ 1♀, 'Fort Beaufort / "Umdala" [32°48'S:26°39'E] / E. Cape' ~ 'S A Museum / March 1954' (SAMC); 1♀, 'Sth Africa Cape Prov / ca. 16km NE Hogsback / on Cathcart Road / 3226BD 19.i.1984 / D. & C. Barraclough / Rocky hillside'; 1♂, 'Papiesfontein [33°58'S:24°59'E] Gamtoos Mth' ~ 'S.A.M. / 1:60' (SAMC); 1♂, 'S Africa: Cape / Addo Elephant / National Park / 33°27'S 25°45'E / 16.i.1983 / R.M. Miller'; 2♂ 2♀, 'Lourie [Loerie 33°52'S:25°01'E] / E.C.P.' ~ 'S.A.M. / 1:60' (SAMC); 4♂, 'Port Elizabeth [33°58'S:25°35'E] / E.C.P.' ~ 'Jan, 1960 / S.A.M.' (SAMC); 1♂ 2♀, 'Walmer [33°59'S:25°35'E] / Port Elizabeth / E.C.P.' ~ 'F.W. Gess / S.A.M. / Jan 1960' (SAMC); 1♀, 'Algoa Bay [= Port Elizabeth] / Capland / Dr. Brauns / 1911'; 2♀, 'S Africa: Cape #7 / 6km E of Alicedale / 33°19'S:26°07'E, 600m / Date: 21.xi.1990 / Whittington & Londt / New Years Dam area'; 1♂ 1♀, 'RSA 2-3.01.1993 / Cape Province, Swellen-/ dam. [34°02'S:20°26'E] Bontebok Nat. P / leg. F. Koch' (ZMHB).

Type locality: South Africa, KwaZulu-Natal, Matatiele.

Comments: A distinctive, large species. Although distribution appears to be centred on the Eastern Cape Province of South Africa (Fig. 249), the species is also recorded from KwaZulu-Natal and the Western Cape Province. The species appears to be found in five different climatic areas (i.e. Mediterranean, Little & Great Karoo, S. Cape Coastal, S.E. Cape Coastal, Drakensberg) using the classification of Schultz (1965).

Afromochtherus mendax (Tsacas, 1969) (Figs 66–72)

Neomochtherus mendax Tsacas, 1969: 22–23.
Afromochtherus mendox [sic]; Lehr, 1996: 72.

Type material: **Holotype**: SOUTH AFRICA: 1♂ [not seen], Steynsburg [3118S:2549E], Cape, 1906, E. Hang (MNHN).

Material examined: NAMIBIA: 1♂, Otjinungwa, SE1712Ab, 17–22.xi.1970, H10972 (NMNW); 4♂ 3♀, Zesfontein [19°08'S:13°37'E], S W A, ii.1925, Mus Exped. (SAMC); 1♂, Elshorst 90 [Farm], 20°58'S 16°15'E, Otjiwarongo, 11–12.i.1975, H29183 (NMNW); 1♂, Omaruru, SE2115Bd, 15, 17.xi.1971, H5191 (NMNW); 1♂, Windhoek, SE2217Ca, H5645 (NMNW); 1♂, Rooibank [23°11'S:14°39'E], Kuiseb River Bed, 7.ii.1978, Lomholdt, small dunes with bushes (ZMUC); 9♂ 2♀, Gobabeb [23°33'S:15°02'E], Kuiseb River Bed (5♂) flowing (4♂ 2♀), 8 (2♂ 1♀), 10 (2♂ 1♀) & 14.ii.1978 (5♂), Lomholdt (ZMUC, 1♂ NMSA); 1♀, Namib Desert, SWA, 23°34'S 15°03'E, 20.i.1983, Praetorius (NMNW); 2♂ 1♀, Noachabeb 97 [Farm], Keetmanshoop, SE2718Ad, 7–12.i.1972, H5857 (NMNW); 2♂ 1♀, Fish River Canyon [27°40'S:17°35'E], 11.i.1993, Koch, auf Plateau (ZMHB); 2♂, Fish River Canyon Park (Ai-Ais) [27°55'S:17°29'E], 19–21.xi.1993, Koch (ZMHB); 3♂ 1♀, Ai-Ais, Fish River Canyon, 7–8.x.1993, Koch (ZMHB). SOUTH AFRICA: 1♀, Nelspruit [25°28'S:30°58'E], xii.1917, Breijer; 1♂, Kimberley [28°44'S:24°46'E], xi.1912, Power (SAMC); 1♀, Brandbos, 28°33'S 16°36'E, 14.ii.1979, Lamoral; 1♀, Orange River, Vioolsdrif [28°46'S:17°39'E], 9.i.1993, Koch (ZMHB); 1♂, Tweerivier [29°14'S:17°43'E], 3.i.1942, Ac.US; 1♀, Edenburg

[29°94'S:25°56'E], 28.xii.1977, Herrmann; 1♀, Garies [30°33'S:17°59'E], Namaqualand, vi.1930, Museum Staff (SAMC); 1♂, Akkerendam Nat. Res., 1 km N. Calvinia, 31°26'55"S:19°46'22"E, 1260 m, 9–10.xi.1998, Londt, Karoo vegetation; 1♀, Calvinia [31°28'S:19°47'E], 7.iii.1903 (SAMC); 1♂ 1♀, 8 km W. Williston, 31°20'48"S:20°50'52"E, 1080 m, 10.xi.1998, Karoo vegetation at foot of rocky ridge; 1♂, 23 km N. of Middelpos, 31°44'S:20°14'E, 1170 m, 29.xi.1990, Whittington & Londt, At Kookfontein River; 2♀, Liebendal [31°43'S:25°55'E], xi.1956, S A M (SAMC); 1♂ 1♀, Bulshoek [32°01'S:18°47'E] Clw [Clanwilliam], xii.1956, S A M (SAMC); 1♂ 2♀, 18 km N. Sutherland, 32°16'S:20°41'E, 1350 m, 26.xi.1990, Londt & Whittington, Renosterrivier area; 1♀, 35 km N.E. Sutherland, 32°18'S:20°00'E, 1300 m, 27.xi.1990, Londt & Whittington, Rietrivier bridge area; 1♂ 6♀, Nieuveld Escarpment, Rietvlei [3221BB], i.1949, Zinn-Hesse, Mus. Exp. (SAMC); 2♂ 2♀, Merweville [32°40'S:21°31'E], Laingsburg Distr., i.1959, Zinn (SAMC); 4♂ 3♀, Merweville Distr. C.P, i–ii.1947, Zinn (SAMC); 1♂ 1?, Gouph [32°25'S:21°43'E], Laingsburg Dist., x.1939, Mus Staff (SAMC); 6♂ 3♀, Karoo Nature Reserve West of Graaff Reinet, 32°14'S:24°29'E, 900 m, 7–8.xii.1989, J. & H. Londt, Rocky slope, Savannah; 1♂, Karoo Nat. Park [near Beaufort West 32°21'S:22°35'E], 21–22.x.1993, Koch (ZMHB); 4♂, Beaufort West [32°21'S:22°35'E] Dist., ii.1958, S A M (SAMC); 3♂, Graaff-Reinet, Urquhart Park Caravan Park, 32°15'S:24°33'E, 4–6.xii.1988, Londt, Riverine veget., Sandy ground; 2♂, Mountain Zebra Nat. P., 24 km W. Cradock, 3225AB, 21.i.1984, D. & C. Barraclough, Rocky hillside; 2♂ 3♀, Mountain Zebra Nat Park, 3225AD, 17-21.xii.1985, Londt, Bushveld vegetation; 1♀, Somerset Oos [= Somerset East 32°43'S:25°35'E], xii.1944; 2♂ 1♀, Gardiner's Drift [32°42'S:26°18'E], Adelaide, iii.1954, SA Museum (SAMC); 1♂, Fort Beaufort, "Umdala" [Farm 32°48'S:26°39'E], iii.1954, SA Museum (SAMC); 1♀, Hex Riv [33°20'S:19°35'E], xii.[?18]94' (SAMC); 1♀, Ceres Div. Matroosberg [33°23'S:19°40'E], 4 000 ft, i.1917, Lightfoot (SAMC); 9♂ 8♀, 5 km S. of Laingsburg, 33°14'S:20°52'E, 700 m, 25.xi.1990, Londt & Whittington, Banks Buffels River; 1♂ 1♀, Constable [33°15'S:20°19'E], C.P., ii.1958 (SAMC); 3♂ 3♀, Rooinek [33°20'S:20°55'E], Laingsburg Distr., i.1949, Zinn-Hesse, Mus. Exp. (SAMC); 1♀, 8♂, N.E. of Touws R. [33°20'S:20°02'E], xii.1962, S A M (SAMC); 1♂, Cogman's Kloof, 3320Cc, Ashton-Montague Road, 11.i.1983, Stabbins & Miller along river; 2♀, Spitzkop [33°03'S:20°35'E], Laingsburg Dist., iii.1938, Mus Staff (SAMC); 3♀, 70 km E. of Laingsburg, 33°06'S:21°35'E, 500 m, 24.xi.1990, Whittington & Londt, Dry Dwyka River area; 1♂ 3♀, Gamka River, 40 km N. Prince Albert, 3321BB, 11.xi.1986, 500 m, Londt & Quickelberge, Sandy area / Acacias; 1♂ 1♀, 5 km S. Prince Albert, 33°17'S:22°03'E, 800 m, 24.xi.1990, Whittington & Londt, nr. Scholtzkloof road; 2♂ 2♀, Meiringspoort, 3322BC, 11–12.xii.1979, Londt & Stuckenberg, Rocky hillside & stream edge; 1♂, Willowmore [33°17'S:23°29'E], 5.ii.1927, Brauns, 3171 / 3.[? illegible]; 5♂ 3♀, Bo Kouga [33°40'S:23°28'E], Uniondale Distr., C.P., iii.1954, SA Museum (SAMC); 1♀, 6 km N. Uniondale, 3323CA, 11.xii.1979, Stuckenberg & Londt, Dry Karoo vegetation; 1♂, Dunbrody [33°28'S:25°33'E], 1901, O'Niel (SAMC); 1♀, Dunbrody, 1897, O'Niel (SAMC); 3♂ 4♀, Hermanus, Hermanus Beach Club, 34°26'09"S:19°12'47"E, 0 m, 15.xii.2000, Londt, Rocks; 1♂ 1♀, 7 km S. Swellendam, 3420Ab, Bontebok National Pk., iii.1979, Braack, Malaise trap, nr. river; 1♂, Swellendam [34°02'S:20°26'E], Bontebok Nat. P., 2–3.i.1993, Koch (ZMHB); 1♀, Riversdal [Riversdale – 34°06'S:21°16'E], ii.1950, Conradie; 1♀, Jeffreysbaai [34°03'S:24°55'E], xii.1952, Heyns. ZIMBABWE: 4♀, Matopos Nat. Park [20°35'S:28°40'E], 28.xi.–1.xii.1993, Koch (ZMHB).

I have also seen the following specimen which does not appear to be conspecific – SOUTH AFRICA: 1♀, Meiringspoort, 3322BC, 11–12.xii.1979, Londt & Stuckenberg, Rocky hillside & stream edge.

Material not studied: 1♀, '8 mi. west of Humansdorp, 1.3.1951, loc. No. 193, Brinck and Rudebeck' (MZLU) (cited Hull, 1976 who also listed a specimen merely as *Neomochtherus* sp. which may well be *A. mendax*, but this identification requires verification).

Type locality: South Africa, Eastern Cape, Steynsburg.

Comments: I have not seen the unique holotype, but Tsacas' (1969) description and illustrations are adequate for me to confidently assign the many new records provided above to this species. The reduced microtrichial distribution of the wings and the unique form of the epandrial lobes, especially in the distal region, make the species readily separable from its congeners. Previously known only from the type locality, the distribution of *mendax* is now known to be extensive (Fig. 250). Although probably centred in the south-western parts of South Africa, the Namibian records and one from Zimbabwe suggests that a far wider distributional pattern may emerge through future collecting. The species appears to be associated with hot, dry, sandy situations where individuals are usually collected resting on the ground. The relatively short, broad ovipositor is probably well-suited for depositing eggs in sand. The Hermanus specimens collected by me were invariably found on rocks within a few metres of the sea.

Afromochtherus mkomazi sp. n. (Figs 73–79)

Etymology: Named after the type locality of Mkomazi Nature Reserve.

Diagnosis: *Head*: Antennal scape blackish, pedicel mostly yellowish; postpedicel shorter than stylus. *Thorax*: Postpronotal lobe with setae of intermediate length. Dorsocentrals posterior to transverse suture only. Microtrichial coverage of wing moderate in distal area (proximal tip of cell r_5 bare). Prothoracic femur with long, fine, hair-like posteroventral setae only. Metathoracic coxa with one lateral macroseta; trochanter brownish yellow; femur yellow with brown-black markings anteriorly and macrosetae dark red-brown to black, although there may be a few yellow/white ones. *Abdomen*: Ovipositor relatively short and broad (length:width ratio, measured dorsally <3.3) and relatively short and deep (length:depth ratio, measured laterally <2.8). Gonocoxite length:width ratio <1.6. Distal margin of S8 lacking medial process or sclerotised area. Ventromedial area of hypandrium greatly constricted (*ca.* one quarter width of lateral parts). Gonostylus distally clubbed (viewed ventrally). Aedeagal terminal filaments not obvious. Gonostylus longer than gonocoxite (viewed ventrally). Aedeagus straight, relatively short and laterally compressed. Epandrium well-developed and rather bulbous (lobes almost as wide as long in dorsal view) with dorsal lobe. Distal tips of epandrial lobes turned sharply inwards towards each other such that tips touch.

Material examined: **Holotype**: TANZANIA: 1♂, 'Tanzania: Mkomazi / Game Reserve. Ibaya / Camp. 3°58'S:37°48'E / 880m A Russell-Smith / 16–17.ix.94 Unburnt hill.' **Paratypes**: TANZANIA: 1♂, 'Tanzania: Mkomazi / Game Reserve. Ibaya / Camp. 3°58'S:37°48'E / 880m A Russell-Smith / 20.xi.95 Unburnt hill.'; 1♂, 'Tanzania: Mkomazi / Game Reserve. Ibaya / Camp. 3°58'S:37°48'E / 880m A Russell-Smith /

Unburnt hillside 13.x.95'; 6♂ 4♀, ' Tanzania: Mkomazi / Game Reserve. Ibaya / Camp. 3°58'S:37°48'E / 880m A Russell-Smith / Burnt hillside 13.x.(2♂), 14.x.(2♂ 1♀), 15.x.(1♀), 16.x.(1♂ 1♀), 18.xi.(1♂ 1♀) 1995'; 2♂ 1♀, ' Tanzania: Mkomazi / Game Reserve. Ibaya / Camp. 3°58'S:37°48'E / 880m A Russell-Smith / Malaise trap 29.i.1996'; 1♀, 'Tanzania, Mkomazi / Game Reserve, Ibaya / Camp 3·58S 37·48E / 25.xii.1995–29.i.1996', 'S. van Noort / Malaise trap / *Acacia*/*Commiphora* / *Combretum* bushland' (SAMC).

Type locality: Tanzania, Mkomazi Game Reserve, Ibaya Camp.

Comments: Known only from the Mkomazi Game Reserve in northern Tanzania. The only other species known from this region is *unctus* (Table 6), which is easily distinguished by its distinctive male genitalia.

Afromochtherus peri sp. n. (Figs 80–86)

Etymology: Named after Per Forchhammer whose collecting activities in Botswana greatly advanced our knowledge of southern African Asilidae.

Diagnosis: *Head*: Antennal scape and pedicel yellowish; postpedicel shorter than stylus. *Thorax*: Postpronotal lobe with short setae. Dorsocentrals posterior to transverse suture only. Microtrichial coverage of wing moderate in distal area (proximal tip of cell r_5 bare). Prothoracic femur with 2–3 shortish posteroventral macrosetae. Metathoracic coxa with two lateral macrosetae; trochanter brownish yellow; femur anteriorly yellow with brown-black markings and with dark red-brown to black macrosetae. *Abdomen*: Ovipositor relatively short and broad (length:width ratio, measured dorsally <3.3) and relatively short and deep (length:depth ratio, measured laterally <2.8). Gonocoxite length:width ratio 1.6–2.0. Distal margin of S8 with median sclerotised area. Ventromedial area of hypandrium greatly constricted (*ca.* one quarter width of lateral parts). Gonostylus distally clubbed (viewed ventrally). Aedeagal terminal filaments not obvious. Gonostylus longer than gonocoxite (viewed ventrally). Aedeagus straight, relatively short and laterally compressed. Epandrium with small dorsal process/lobe rather distally located.

Material examined: **Holotype**: SOUTH AFRICA: 1♂, 'S Africa: N-W Province / Pilanesberg National Park / Bakubung 12–19.xi.1999 / 25°20'40"S:27°03'25"E / JGH Londt 1170m Camp'. **Paratypes**: BOTSWANA: 12♂ 12♀, 'Botswana SE2226BD / Serowe. Farmer's / Brigade. Malaise / trap. Forchhammer' [basic label – dates and trap number where indicated as follows] ix-88 trap 7 (3♂ 1♀), ix-88 trap 8 (1♂ 1♀), x-88 trap 8 (2♂ 1♀), xi-88 trap 9 (1♂ 3♀), ix-89 (3♂ 3♀), x-89 (2♂ 1♀), xi-89 (2♀); 9♂ 5♀, 'Botswana SE2226BD / Farmers Brigade 5km / SE of Serowe Hillside / N Slope P Forchhammer' [basic label – dates and other details as follows] 30-xi-1983 Malaise trap 1 (1♀), 13-i-85 Malaise trap 1 (1♂), xi-85 Malaise trap 1 (2♂), ix-86 Malaise trap 3 (2♂), xi-86 Malaise trap 2 (2♂), ix-87 inside house (1♀), xi-87 M.T. 6 (1♂ 1♀), xii-87 M.T. 6 (1♀), 3-xi-88 (1♀), ix-92 Mercury vapour lamp (1♂); 1♀, 'Serowe / M.T. 6 / xi-87'; 1♂, 'Botswana / Serowe / MT 6 x-87'; 1♂, 'Botswana: Serowe #56 / Farmer's Brigade / 22°25'S:26°44'E 1000m / Date: 28.xi.1990 / Coll: P. Forchhammer / Malaise Trap'; 3♂ 1♀, 'Botswana: Serowe #63 / Farmer's Brigade / 22°25'S:26°44'E 1000m / Date: ix.1990 / P. Forchhammer / Malaise Trap'; 2♂ 3♀, 'Botswana: Serowe #65 / Farmer's Brigade / 22°25'S:26°44'E 1000m / Date: x.1990 / P. Forchhammer /

Malaise Trap'; 1♂ 1♀, 'Inside house / Serowe, Botswana / Forchhammer Leg. / Date: 22–9/82 (M) 5–10/82 (F) / J.No. / Day'; 1♂ 1♀, 'Day / Serowe, Botswana / Forchhammer Leg. / Date: 12-x/82 (♀) 27-10/82 (♂)'. SOUTH AFRICA: 1♂, 'Potgietersrus / SE 2428Bb / xii.1978 / R de Kock / Dept. of Entomology / University of Pretoria'; 1♂, same data as holotype; 1♀, 'Pretoria [25°45'S:28°10'E] / Tvl / J.T. 10.1931'; 2♂ 4♀, 'Sth Africa Transvaal / Halfway House [25°59'S:28°07E] / By River / R Elferink 22.xii.1981'; 1♂, 'South Africa Transvaal / Kruger Park 9-xii-1972 / Olifants River nr Balule / riparian woodland 2431Bb / B & P Stuckenberg'; 1♂, 'Suid-Africa / Potch [Potchefstroom – 26°43'S:27°05'E] / 24-12-1942 / H.P.V. Heerden'. ZIMBABWE: 1♂, 'Bulawayo [20°09'S:28°35'E] / S. Rhodesia / 4.xi.1923 / Coll. R. Stevenson' (SAMC); 1♀, 'Plukridge [?] / S. Rhodesia / Oct–Nov 1927, Stevenson' (SAMC).

Other material examined (no type status): BOTSWANA: 8♂ 4♀, Serowe, Farmer's Brigade (22°25'S:26°44'E), ix (3♂ 2♀) x (4♂ 2♀) xi.1989 (1♂), P. Forchhammer, Mercury V.L. (NHRS); 18♂ 6♀, Gabarone Village [= Gaberones Village 24°38'S:25°54'E], 9–18.xi (7♂ 1♀) 18-25.xi (6♂ 4♀) 25.xi–6.xii.1993 (5♂ 1♀), Bert Viklund, Museum garden Malaise trap (NHRS).

Type locality: South Africa, North-West Province, Pilanesberg National Park, Bakubung Camp.

Comments: The species is similar to *malawi* and *sathus*, but can be readily distinguished using male genital characteristics. The species' distribution appears to be centred on an area in the northern part of South Africa that includes eastern Botswana and southern Zimbabwe (Fig. 249).

Afromochtherus sathus sp. n. (Figs 87–94)

Etymology: Gr. *sathos* – one with a large penis, refers to the large aedeagus of this species.

Diagnosis: *Head*: Antennal scape and pedicel yellowish; postpedicel shorter than stylus. *Thorax*: Postpronotal lobe with short setae. Dorsocentrals posterior to transverse suture only. Microtrichial coverage of wing moderate in distal area (proximal tip of cell r_5 bare). Prothoracic femur with two or three shortish posteroventral macrosetae. Metathoracic coxa with two lateral macrosetae; trochanter brownish yellow; femur anteriorly yellow with brown-black markings and with dark red-brown to black macrosetae. *Abdomen*: Ovipositor relatively short and broad (length:width ratio, measured dorsally <3.3) and relatively short and deep (length:depth ratio, measured laterally <2.8). Gonocoxite length:width ratio 1.6–2.0. Distal margin of S8 lacking medial process or sclerotised area. Ventromedial area of hypandrium greatly constricted (*ca.* one quarter width of lateral parts). Gonostylus distally clubbed (viewed ventrally). Aedeagal terminal filaments not obvious. Gonostylus longer than gonocoxite (viewed ventrally). Aedeagus straight, relatively short and laterally compressed. Epandrium with dorsal process/lobe.

Material examined: **Holotype**: ZIMBABWE: 1♂, 'Rhodesia / Salisbury [= Harare 17°50'S:21°03'E] / A. Watsham'. **Paratypes**: ZAMBIA: 1♂, 'Kafue Riv. [15°56'S:28°55'E] / J. Drury / 08' (SAMC). ZIMBABWE: 1♂ 1♀, 'Rekometjie Research / Station [16°08'S:29°24'E] / 17/10/73 [♂] 22/10/73 [♀] / R. J. Phelps'; 1♂, 'Zimbabwe / Matetsi [18°03'S:26°36'E] / 4 Oct. 1978 / E.M. Jones'; 1♂ 1♀, 'Rhodesia / Stuckenberg / October 1957', 'Wankie [= Hwange 18°22'S:26°29'E] Dist.'

Type locality: Zimbabwe, Harare.
Comments: Known only from a few localities in Zimbabwe; this species is similar to *malawi* and *peri*. The remarkable development of the gonostyli distinguishes the species from its congeners.

Afromochtherus unctus (Oldroyd, 1939) (Figs 95–102)

Neomochtherus unctus Oldroyd, 1939: 37; Hull, 1962: 591; Tsacas, 1969: 31–32.
Neomochtherus genialis Tsacas, 1969: 18. **Syn. n.**
Afromochtherus unctus; Lehr, 1996: 72.
Afromochtherus genialis; Lehr, 1996: 72.

Type material: **Holotype**: KENYA: 1♂ [*unctus* seen], ‘Holo- / type’, ‘♂ / Type’, ‘Chania Falls. [stream 01°02'S:37°04'E] / 4,000 ft. / F.W. Edwards.’, ‘Kenya: / Aberdare Range. / x.1934. / B.M.E.Afr.Exp. / B.M. 1935-203.’ (BMNH); **Holotype**: MALAWI: 1♂ [*genialis* seen] 1♀ **allotype**, 1♂ **paratype** [not seen], Mlanje [1602S:3530E], 11.xii.1914, S. E. Neave (BMNH).
Material examined: MALAWI: 1♂ 1♀, Zomba Plateau, 1535Ad, 1500 m, 24–27.xi.1980, Stuckenberg & Londt, Montane forest; 4♂ 4♀, Mulanje Mnt., Likabula river valley, 1535Dc, 1000 m, 28–30.xi.1980, Stuckenberg & Londt, Riverine *Brachystegia* woodland. TANZANIA: 1♂, Mkomazi Game Reserve, Ibaya Camp, 3°58'S:37°48'E, 880 m, 27–28.xi.1994, Russell-Smith, Unburnt hill; 2♂, Mkomazi Game Reserve, Kisima Plot, 4°06·06'S 38°05·58'E’, 25.xi.–8.xii.1995, van Noort, Malaise trap, *Acacia*/ *Commiphora* bushland (SAMC).
Type locality: Kenya, Aberdare Range, Chania Falls area.
Comments: I have studied the unique holotype of *unctus* which Tsacas probably did not see as he provided no detailed illustrations of the genitalia, but merely repeated Oldroyd’s (1939) figure. I also examined the holotype of *genialis*, and although there is some individual variation, I believe these specimens to be conspecific. Other specimens also show slight morphological differences when compared with the holotype. These differences have been accepted as intraspecific variation.

Afromochtherus zoropegus sp. n. (Figs 103–109)

Etymology: Gr. *zoros* – pure + *pege* – water, derived from the Afrikaans type locality name of Louterwater, which means ‘pure water’.
Diagnosis: *Head*: Antennal scape blackish, pedicel mostly yellowish or both segments blackish, pedicel with at most a narrow yellowish apex; postpedicel longer than stylus. *Thorax*: Postpronotal lobe with short setae. Dorsocentrals posterior to transverse suture only. Microtrichial coverage of wing moderate in distal area (proximal tip of cell r_5 bare). Prothoracic femur with two or three shortish posteroventral macrosetae. Metathoracic coxa with two or three lateral macrosetae; trochanter brownish yellow; femur anteriorly yellow with brown-black markings and with dark red-brown macrosetae. *Abdomen*: Ovipositor relatively short and broad (length:width ratio, measured dorsally <3.3) and relatively short and deep (length:depth ratio, measured laterally <2.8). Gonocoxite length:width ratio 1.6–2.0. Distal margin of S8 with weakly developed sclerotised area. Ventromedial area of hypandrium greatly constricted (*ca*. one quarter width of lateral parts). Gonostylus distally clubbed (viewed ventrally). Aedeagal terminal

filaments short and poorly developed. Gonostylus longer than gonocoxite (viewed ventrally). Aedeagus straight, relatively short and laterally compressed. Epandrium with dorsal process/lobe.

Material examined: **Holotype**: SOUTH AFRICA: 1♂, 'Sth Africa: Cape Prov / Louterwater 3323DC / 13.xii.1979 J Londt / B Stuckenberg grass / & hillside macchia'. **Paratypes**: SOUTH AFRICA: 2♂, 'Leipoldtville [32°13'S:18°29'E] / S.A.M. 11.58 [xi.1958]' (SAMC); 1♂, 'South Africa / Ceres [33°22'S:19°19'E] / Jan. 1950 / W. Hanekom'; 1♂, 'Upper Sources / Olifants River / Ceres [33°22'S:19°19'E] C. P.' ~ 'Mus. Exp. / Dec. 1949' (SAMC); 1♂ 1♀, 'J.J.S. Le Roux / Rawsonville [33°41'S:19°19'E] / Suid-Africa / 27.12.1943 (♂) 17.12.1943 (♀)'; 2♂ 1♀, 'Willowmore [33°17'S:23°29'E] / Capland / Dr. Brauns', '3024 / 4.9' (1♂); 1♀, 'Capland / Willowmore / 10.I.1922 / Dr. Brauns'; 1♂, 'Capland / Willowmore / 5.I.1927 / Dr. H. Brauns / Georgida'; 1♂ 1♀, same data as holotype.

Type locality: South Africa, Eastern Cape, Louterwater.

Comments: Similar to *melanurus*, but separable on genital differences. The distribution is confined to the Western Cape Province of South Africa (Fig. 249), which is characterised by winter rainfall.

Aneomochtherus Lehr, 1996

Aneomochtherus Lehr, 1996: 75. Type-species: *Neomochtherus micrasiaticus* Tsacas, 1968, by original designation.

Diagnosis: *Head*: Antennal style composed of three elements including terminal spine; postpedicel less than twice as long as scape; scape predominantly blackish. Facial gibbosity moderately well developed, occupying approximately half distance between lower facial margin and antennal sockets. Face relatively broad (width of head divided by width of face at same level <7). *Thorax*: Postpronotal lobe equipped with longish slender setae. Mesonotum with dorsocentral macrosetae extending anterior of transverse suture. Scutellum usually with two marginal macrosetae. Metathoracic coxa with one lateral macroseta. Metathoracic femur with areas of black and yellow. *Abdomen*: Pruinescence extends uniformly over at least seven segments. Female cerci dorsally finely setose. Ovipositor shortish, broad proximally, laterally compressed distally. Epandrium with complicated arrangement of lobes and processes distally. Aedeagus bowed upwards. Hypandrium medially narrowed.

Note: See also illustrations, key and character matrix (Table 3) for morphological information.

Key to species of *Aneomochtherus* Lehr, 1996

Notes:

- The type(s) of *Mochtherus deserticolus* Karsch, 1888 (treated as a *Neomochtherus* by Hull (1962) and transferred to *Aneomochtherus* by Lehr (1996)) have not been traced. Although details are provided below, the species cannot be included in the key.
- See character matrix (Table 4) for additional morphological information.

1 Metathoracic femur with narrow dark red-brown distal tip, and dark anterior marking at mid-length that is at least three times as long as wide; microtrichia cover much of wing membrane, but proximal half of discal cell largely lacking microtrichia.

Known only from Kenya. (Figs 110–116) .... **africanus** (Ricardo, 1919) (= *signatipes*)

Note: ♂ from 6 km S.W. Kampi-Ya has legs rather like *monobia*, other characters are more typical of *africanus*.

– Metathoracic femur with broad dark red-brown distal end and dark anterior marking at mid-length that is at most twice as long as wide; microtrichia cover much of wing membrane including most or all of proximal half of discal cell. Known only from Tanzania. (Figs 117–123) .... **monobia** (Speiser, 1910)

Aneomochtherus africanus (Ricardo, 1919) (Figs 110–116)

Heligmoneura africanus Ricardo, 1919: 77–78.
Neomochtherus signatipes Lindner, 1955: 41–43. **Syn. n.**
Neomochtherus africanus; Tsacas, 1969: 6–7.
Aneomochtherus africanus; Lehr, 1996: 78.
Aneomochtherus signatipes; Lehr, 1996: 78.

Type material: **Holotype**: KENYA: 1♀ [*africanus* seen], 2♀ **paratypes** [not seen], 'Magadi [01°54'S:36°17'E], Brit. E. Africa, April 1912, FG Hamilton' (BMNH). **Holotype**: TANZANIA: 1♂ [*signatipes* not seen], Ngaruka [= Nguruka 08°07'S: 31°02'E], 29 Jan–14 Feb 1952 (SMNS).

Holotype designation: Although Ricardo (1919) did not designate a holotype as such, she only had three specimens, all female, one of which she designated (in her usual manner) as 'Type'. There can be no confusion as to which specimen be considered the holotype. The other two specimens are therefore treated as paratypes.

Material examined: KENYA: 1♂, 6 km S.W. Kampi-Ya-Samaki (Lk. Baringo), 00°35'N:36°00'E, 1020 m, 31.v.1980, Lamoral; 3♂, Rt. A 104, 15 km S.E. Nairobi [01°17'S:36°49'E], 29.iv.–15.v.1991, Freidberg & Kaplan; 1♂ 2♀ , Rt. A 109, Athi River [02°59'S:38°31'E], 30.iv.1991, Freidberg & Kaplan, Malaise trap.

Type locality: Kenya, Magadi.

Comments: The literature relating to *signatipes* is confusing. Lindner (1955) apparently described the species on a single male from Ngaruka (Tanzania) collected in 1952. Tsacas (1969), however, lists a holotype ♂ and an allotype ♀ from Mombassa (Kenya) collected in 1922 (material I have not seen). Comparing the figures produced by Lindner and Tsacas suggests that two different species were involved. To add to the confusion, two other similar species, *africanus* and *monobia*, were known only from female specimens. With a few new records from Kenya and the collection of a good series of specimens from Mkomazi Game Reserve (northern Tanzania), close to the type locality of *monobia* (and with male genitalia similar to those figured by Tsacas for *signatipes*), some clarity is now possible. I consider Lindner's *signatipes* to be a synonym of *africanus* and Tsacas' figures to represent *monobia*. The species is apparently confined to Kenya and northern Tanzania.

Aneomochtherus deserticolus (Karsch, 1888)

Mochtherus deserticolus Karsch, 1888: 376.
Heligmoneura deserticola; Kertész, 1909: 286, Ricardo, 1919: 76.
Neomochtherus deserticola; Hull, 1962: 591.
Aneomochtherus deserticola; Lehr, 1996: 78.

Type material: Karsh (1887) studied a single ♂ from 'Bondai'. Ricardo (1919) says the species is from East Africa and Oldroyd (1980) gives the country as Kenya. I cannot find a place by this name in Kenya, but found two in Tanzania – i.e. at 5·25S 38·83E (Tanga/Pangani district) and 4·74S 38·49E (Lushoto district) (co-ordinates given in decimal degrees). Both appear to be in Tanga Province (near the Usambara Mountains), and so I suggest that the country of origin is Tanzania. The name *deserticolus* presumably refers to the nature of the environment in which the specimen was collected (which may be relatively arid, but probably not a desert).

Type locality: Tanzania, Bondei.

Comments: Karsch's (1887) description, in German, is short and the following translation is provided:

27. Mochtherus deserticolus *nov. spec. – Bondei: 1♂.*

Grey pruinose, quite bare; face narrow, whitish pruinescence and haired with few very long black bristles in 2 rows along the middle; proboscis very pointed; legs honey-yellow, femora black striped, tibia black on the distal halves, tarsi black; wing transparent, hind margins grey stained; the small crossvein lies moderately off the middle of the discoidal cell. Body length 12 mm.

Ricardo (1919: 76), without seeing the type material, appears to be expressing doubt that the species had been properly assigned to the genus (i.e. *Heligmonevra*) when she states 'the face with two rows of very black bristles down the middle, a characteristic not very probable in a species of this genus'. The darkly marked legs do, however suggest that the species may be close to both *africanus* and *monobia* (species also found in Tanzania), and so for the present, and until the type material can be found and studied more fully, *deserticolus* is left where Lehr (1996) placed it, in *Aneomochtherus*.

There is a possibility that either *africanus* or *monobia* will eventually be found to be a synonym of *deserticolus*; new material from the type locality is required to confirm the status of the species.

Aneomochtherus monobia (Speiser, 1910) (Figs 117–123)

Heligmoneura monobia Speiser, 1910: 104.
Neomochtherus monobia; Hull, 1962: 591; Tsacas, 1969: 23–24.
Neomochtherus signatipes not Lindner; Tsacas, 1969: 28–30.
Aneomochtherus monobia, Lehr, 1996: 78.

Type Material: **Holotype**: TANZANIA: 1♀ [seen], 'Kilimandjaro [= Kilimanjaro 03°04'S:37°22'E] / Sjöstedt. 1905–6', '1 nov.', '*Heligmoneura / monobia* [followed by illegible short squiggle] / P. Speiser det. / Type !', '110/67 [pink]', '*Neomochtherus / monobia* F / Speiser / Holotype / L. Tsacas 1968' (NHRS).

Material examined: TANZANIA: 1♂, Mkomazi Game Reserve, Ibaya Camp, 3°58'S:37°48'E, 880 m, Russell-Smith, Malaise trap, 29.i.1996; 1♂, Mkomazi Game Reserve, Ibaya Camp, 3°58'S:37°48'E, 880 m, Russell-Smith, 20.xi.1995, Unburnt hillside; 2♂ 1♀, Mkomazi Game Reserve, Ibaya Camp, 3·58S 37·48E, 29 i.–11.iii.1996, van Noort, Malaise trap, *Acacia/Commiphora/Combretum* bushland (SAMC); 1♂ 3♀, Mkomazi Game Reserve, Ibaya Camp, 3·58S 37·48E, 25.xii.1995–29.i.1995 (3♀) 11 March–5 April 1996 (1♂), van Noort, Malaise trap, *Acacia/Commiphora/Combretum* bushland (SAMC); 1♂, Mkomazi Game Reserve, Ibaya Camp, 3·58S 37·48E, 5–14 iv.1996, van Noort, Malaise trap, *Acacia/Commiphora/Combretum* bushland (SAMC); 1♂, Mkomazi Game Reserve, Kikolo Plot, 04°06·72'S 38°01·37'E', 25.xi.–8.xii.1995, van Noort, *Commiphora* woodland, Malaise trap (SAMC).

Type locality: Kilimandjaro, Tanzania.
Comments: With the availability of new material from Kenya and Tanzania (Mkomazi Game Reserve) and the types of *africanus* and *monobia*, it is now possible to clarify the status of these species (see discussion of *africanus* above) and to describe the male of *monobia*. All known records of *monobia* are from northern Tanzania.

Caenoura gen. n.

Type species: *Mochtherus annulitarsis* Loew, 1858, by present designation.
Etymology: Gr. *Kainis* – knife + *oura* – tail. Refers to knife-like ovipositor.
Diagnosis: *Head*: Antennal style composed of three elements including terminal spine; postpedicel more than twice as long as scape; scape blackish. Facial gibbosity moderately well developed, occupying approximately half distance between lower facial margin and antennal sockets. Face relatively broad (width of head divided by width of face at same level <7). *Thorax*: Postpronotal lobe equipped with longish slender setae. Mesonotum with dorsocentral macrosetae extending anterior of transverse suture. Scutellum usually with two marginal macrosetae. Trochanters blackish. Metathoracic coxa with one lateral macroseta. Metathoracic femur primarily yellowish (has darker distal end). *Abdomen*: Pruinescence extends uniformly over at least seven segments. Female cerci dorsally finely setose. Ovipositor elongate and laterally compressed. Aedeagus bowed upwards. Hypandrium medially narrowed.
Note: See also illustrations, key and character matrix (Table 3) for morphological information.

Key to species of *Caenoura* gen. n.

Note: See character matrix (Table 4) for additional morphological information.

1 Wing membrane entirely covered with microtrichia; metathoracic femora with poorly developed dark red-brown distal tip and commonly with yellowish macrosetae anteriorly. Figs 124–130 .... **annulitarsis** (Loew, 1858).

– Wing membrane with microtrichia distally and posteriorly only (r_5 with proximal end without microtrichia); metathoracic femora with well developed, dark red-brown distal tip and with dark red-brown macrosetae anteriorly. Figs 131–137) .. **sinuatus** (Loew, 1858).

Caenoura annulitarsis (Loew, 1858) **Comb. n.** (Figs 124–130)

Mochtherus annulitarsis Loew, 1858: 366; 1860: 241–242.
Heligmoneura annulitarsis; Kertész, 1909: 285; Ricardo, 1919: 76.
Neomochtherus annulitarsis; Hull, 1962: 591; Tsacas, 1969: 7–9; Lehr, 1996: 57.
Neomochtherus ochrapes Hull, 1967: 259–260. **Syn. n.**
Aneomochtherus ochripes [sic]; Lehr, 1996: 78.

Type material: **Holotype**: SOUTH AFRICA: 1♀ [*annulitarsis* not seen], Caffrerei, Wahlberg (NHRS); **Holotype**: SOUTH AFRICA: 1♂ [*ochrapes* not seen], Royal Natal National Park, Tugela Valley, 5.4.1951, loc. No. 265 (MZLU); **Allotype**: 1♀ [*ochrapes* not seen], Rhodes, 10.3.1951, loc. No. 224, Brinck and Rudebeck (MZLU).
Material not studied (cited by Tsacas (1969) as being in BMNH): SOUTH AFRICA: 1♂, Howick [2928S:3014E], 1904-46, J. P. Cregoe; 2♂, Afrique du Sud, 1911-383, Distant Coll.; 1♂ 1♀, Willow Grange [2903S:2957E], 1921-9, R.C. Wroughton.

Material examined: LESOTHO: Bushman’s Pass [29°26'S:27°51'E], 2125–2250 m; Roma Mission [29°27'S:27°44'E], 6000 ft. SOUTH AFRICA: Carolina [26°04'S:30°07'E]; Warden, 2728DD; Ncandu Forest Reserve, 27°53'S:29°42'E, 1700 m; Normandien Forest Res., 27°57'45"S:29°41'03"E, 1950 m; Pongolo Bush Nat. Res., 27°59'20"S:29°42'25"E, 1580 m; 10 km W. Luneburg, 2730BC; Ngome Forest [27°52'S:31°24'E]; 10 km E. Paul Roux, 2828Ac; Somerby farm, 10 km N. of Aberfeldy, 2828Bb; Entembeni Mission, 28°10'S:28°40'E; Sterkfontein Reserve nr. Harrismith [28°17'S:29°08'E]; Windy Corner, 3 km S.E. of Van Reenen [28°22'S:29°23'E], 1600 m; Van Reenen Pass, 2829AD; Golden Gate Nat. Res., 28°30'S:28°40'E, 3500 m; Witsieshoek [28°32'S:28°48'E], 1900 m; Royal National Park, 2828DB; Royal Natal Nat. Park, 28°41'S:28°59'E; Royal Natal National Park, 28°41'30"S:28°57'30"E, 1450 m; Royal Natal Nat. Park, 28°41'S:28°56'E, 1950 m; Royal Natal Nat. Park, 28°41'S:28°56'E, 1440 m; Royal Natal Nat. Park, 28°44'S:28°56'E, 1600 m; Royal Natal Nat. Park, 28°41'S:28°57'E, 1440 m; Harrismith, 28°16'S:29°12'E, 2395 m; Cathedral Peak area, 2829CC, 1800 m; 2.5 km S. Ukhahlamba Res. Station, 2829CC; Ukhahlamba Res. Stn., above 1700 m; Cathedral Peak, 28°57'S:29°12'E, 3075 m; Little Berg summits, Cathedral Peak Forestry Reserve, 5500-6000 ft; Indumeni River headwaters, 8500-9200 ft; Cathkin, Lekkerwater [farm], 28°59'S:29°25'E, 1500 m; Hlatikulu Mountain, 28°13'S:30°01'E, 1380 m; 10 km S.E. Ahrens, 2930BD; Mfongosi [28°42'S:30°48'E], (SAMC); Die Kop, 28°55'51"S:30°56'51"E, 500 m; Babanango [28°22'S:31°05'E], 1607 m; Morgenzon, Melmoth Dist., 28°37'S:31°27'E, 700 m; Nkandla, 2831CA; Nkandla Forest Res., 28°44'35"S:31°09'00"E, 1000 m; Ngoye Forest, 28°50S:31°40E, 400m; Entumeni Nature Res., 28°52'35"S:31°22'54"E, 720 m; Richard’s Bay, 28°48'S:32°06'E, 30 m; Modderpoortspruit, 2927Ab; Champagne [29°00'S:27°27'E]; Monk’s Cowl Nat. Res., 29°03'S:29°24'E, 1440 m; Giants Castle, 2929AB, Giants Castle G. Res., 2929AD; Injasuti Nature Res., 29°12'S:29°22'E, 1500 m 1800 m; 3 km S.E. Nottingham Road, 2929Bd; Umgeni Poort Convent, 2929BD, 1550–1610m; Highmoor State Forest, 29°18'44":29°35'54"E; Loteni, 2929DA; Loteni Nature Res., 2929BC; Loteni Nature Reserve, 29°27'S:29°32'E, 1500 m; Loteni Nature Reserve, 29°27'S:29°32'E, 1560; Loteni Nature Reserve, 29°25'S:29°30'E, 1680 m; Cobham Forest Reserve, 29°41'50"S:29°24'44"E, 1530 m; Garden Castle Nat. Res., 29°45'S:29°15'E, *ca.* 1800 m; Garden Castle Nat. Res., 29°44'S:29°14'E, 1740 m; Garden Castle Nat. Res., 29°45'S:29°11'E, 2000 m; Castleburn resort area, 29°45'19"S:29°17'37"E, 1700 m; Castleburn resort area, 29°44'17"S:29°17'36"E, 1650 m; Bulwer Mountain, SE2929DC; Bulwer Mountain side, 29°48'S:29°45'E, up to 2000 m; Umgeni Valley Ranch, 2930Ac; Umgeni Valley Nat. Res., 29°28'29"S:30°16'18"E, 1020 m; Balgowan area, 29°21'S:30°05'E, 1320 m; Karkloof Nature Reserve, 29°18'33"S:30°13'09"E; Geekies Farm [29°11'S:30°20'E], 1500 m; Karkloof, 2930Ac; Karkloof, 2930AD; Karkloof Falls, 2930Ac, 1500 m; Heidelheim Farm, 29°30'S:30°19'E; Dargle [29°30'S:30°01'E], 4400 ft; Hilton College land, 29°30'51"S:30°18'02"E; Pietermaritzburg, Town Bush, 2930CB; Pietermaritzburg, Montrose [2930CB]; Queen Elizabeth Park, 29°34'00"S:30°19'14"E; Doreen Clark Nat. Res., 29°34'42"S:30°17'21"E, 1140 m; Doreen Clark Nature Reserve, 29°34'43"S:30°17'22"E; Springside N.R., 29°46'S:30°46'E, 600 m; Gillitts [29°47'S:30°48'E]; Rhodes village area, 30°48'S:27°58'E, 1820 m; Bell River at Rhodes, 30°48'S:27°58'E, 1825 m; 37 km N.E. of Maclear, 30°53'S:28°11'E, 1670 m; Naudésnek

Summit, 3028CC; 10 km E. Rhodes, Bottom Naudésnek Pass, 3028CC; Saamloop [30°18'S:29°06'E]; Umtamvuna Nature Res., SE3030CC; Mountain Zebra Natl. Park, 3225Ab, 1400 m; Hogsback, 3226DB. ZIMBABWE: Vumba [19°53'S:31°22'E], 6000 ft. UNKNOWN LOCALITY: Drakensberg Mountains; Grah. T. (SAMC).

Type locality: South Africa, KwaZulu-Natal, Pietermaritzburg, Queen Elizabeth Park – by present designation. Much of Wahlberg's material was simply labelled Caffraria. As he travelled through the Pietermaritzburg area, and the species is commonly found in grassland at Queen Elizabeth Park, this is an appropriate type locality.

Comments: Although I have not seen the unique female holotype, I accept Tsacas' (1969) association of well illustrated males from KwaZulu-Natal. The species can be readily identified by a suite of characters, especially pertaining to the male genitalia. The only species which are similar are *C. sinuata*, another South African species placed in the same genus, and *T. kivuensis* from Central Africa, which has genitalia that clearly place it in *Tsacasiella*. The species appears to be associated primarily with montane grasslands, and has a distribution centred on the Drakensberg mountain range between Lesotho and the South African province of KwaZulu-Natal (Fig. 251). There are, however, a few records of the species from localities quite close to the coast. Apart from being recorded from Lesotho and KwaZulu-Natal, the species is also known from the Eastern Cape, Free State, Mpumalanga and eastern Zimbabwe.

Caenoura sinuatus (Loew, 1858) **Comb. n.** (Figs 131–137)

Mochtherus sinuatus Loew, 1858: 366, 1860: 240–241.
Heligmoneura sinuata; Kertész, 1909: 288; Ricardo, 1919: 76.
Neomochtherus sinuata; Hull, 1962: 591.
Neomochtherus sinuatus; Tsacas, 1969: 30–31; Lehr, 1996: 57.

Type material: **Holotype**: SOUTH AFRICA: 1♀ [seen], '[? illegible tiny label]', '62 [?]', '307', '*Mochtherus / sinuatus*', '234 / 67', '*Neomochtherus / sinuatus* Loew / ♀ Holotype / L. Tsacas 1968' (NHRS).

Material examined: SOUTH AFRICA: 4♂, Entabeni For. Station, Zoutpansberg Range, 2230CC, i.1975, Stuckenberg, indigenous for.; 4♂ 1♀, Zoutpansberg Range, Entabeni Forestry Station, Vera Kop Forest, 23°00'S:30°14'E, c 1350 m, 15.i.1974, Stuckenberg; 2♀, Entabeni For. Res., 23°00'S:30°16'E, 7–11.i.1987, Uys; 1♀, Woodbush [23°44'S:30°02'E], i.1923, Roberts; 1♂, 16 km North of Sabie, 25°[error – 24°]58'S:30°49'E, 1350 m, 11.xii.1997, J. & A. Londt, Forest Falls trail; 1♂, Pongolobush Nat Res, 2730BC, 15 km W. Luneburg, 19.ii.1979, Londt, Forest & surrounding area; 1♂ 1♀, Nkandla Forest Res., 28°44'35"S:31°09'00"E, 1000 m, 27.i.1988, Londt, Mistbelt Mixed Forest margins; 2♂ 2♀, n'Kandhla [= Nkandla] Forest, i.1937, Lawrence (SAMC); 1♂, Eshowe [28°53'S:31°28'E], Dlinza forest, 17.i.1984, Reavell, In shade on ground; 1♂ 1♀, Eshowe, Dlinza Forest Nature Res., 2831Cd, 450 m, 22.xii.1979 (♀) 21.i.1980 (♂), Miller & Stabbins, indig. for.; 1♀, Dlinza Forest Reserve, 28°53'30"S:31°26'50"E, 530 m, 26–27.1.1988, Londt, Coast Scarp Forest; 1♀, St Lucia, Smith's Farm, 28°20'S:32°25'E, 40 m, 12.i.1986, Reavell, Grass patch in sandveld forest; 1♂, Pietermaritzburg, Town Bush, 2930Cb, 14.iii.1981, Londt; 1♂, Town Bush, 2930CB, Pietermaritzburg, 22.iv. 1980, Londt; 1♂, Town Bush, Pietermaritzburg, iv.1976, Miller; 1♀, Townbush Valley, Pietermaritzburg, xii.1976, Miller, malaise; 1♂ 1♀, Town Bush, Pietermaritzburg, iv.1976, Miller; 1♀, Town Bush, Pietermaritzburg, 2.ii.1984,

Griswold; 1♀, Pietermaritzburg, Town Bush, 2930Cb, 10.iii.1983, Londt. ZIMBABWE: 1♀, Mnt. Selinda [20°25'S:32°42'E], xii.1935, van Son.
Material not studied: Ricardo (1919) reported 'males and females from Malvern and Howick, Natal, J P Cregoe and G A K Marshall'.
Type locality: South Africa, KwaZulu-Natal, Pietermaritzburg, Ferncliffe Nature Reserve – by present designation. As much of Wahlberg's material was simply labelled Caffraria, and as he travelled through the Pietermaritzburg area where the species has been found at Ferncliffe Nature Reserve, this is an appropriate type locality.
Comments: Loew (1858) described the species on a unique female specimen, but later referred to a male (Loew 1860) which I have not seen. Tsacas (1969) redescribed the holotype without reference to the male (whose repository is not known). I feel sure that the males I have listed are correctly associated with the holotype. The extent of microtrichial coverage of the wings easily separates the species from its congener *annulitarsis*. Although there are only a few records, the species appears to be limited to montane forests in the eastern parts of South Africa and Zimbabwe (Fig. 252). The specimen from Zimbabwe has antennae which show slight differences from other material.

Dikowmyia gen. n.

Type species: *Dikowmyia mediorus* sp. n. by monotypy and present designation.
Etymology: Named for Torsten Dikow, who has encouraged my work on asilids.
Diagnosis: *Head*: Antennal style composed of three elements including terminal spine; postpedicel more than twice as long as scape; scape predominantly blackish. Facial gibbosity moderately well developed, occupying approximately half distance between lower facial margin and antennal sockets. Face relatively broad (width of head divided by width of face at same level <7). *Thorax*: Postpronotal lobe equipped with longish slender setae. Mesonotum with dorsocentral macrosetae extending anterior of transverse suture. Scutellum usually with two marginal macrosetae. Metathoracic coxa with one lateral macroseta. Metathoracic femur with areas of black and yellow. *Abdomen*: Pruinescence extends uniformly over at least seven segments. Female cerci dorsally finely setose. Epandrial lobes shortish and converging strongly distally. Aedeagus bowed upwards at about midlength and with three short, well developed terminal prongs. Hypandrium medially narrowed.
Note: See also illustrations, key and character matrix (Table 3) for morphological information.

Dikowmyia mediorus sp. n. (Figs 138–145)

Etymology: L. *medius* – middle + *rus* – country, refers to the situation of the type locality in the KwaZulu-Natal midlands.
Diagnosis: *Head*: Antennal scape and pedicel blackish, pedicel with at most a narrow yellowish apex; postpedicel longer than stylus. *Thorax*: Postpronotal lobe with long setae. Dorsocentrals present both anterior and posterior to transverse suture. Microtrichia cover entire wing. Prothoracic femur with long, fine, hair-like posteroventral setae. Metathoracic coxa with one lateral macroseta; trochanter blackish; femur anteriorly yellow with brown-black markings and with black and yellow/white macrosetae.

Abdomen: Ovipositor relatively short and broad (length:width ratio, measured dorsally <3.3) and relatively short and deep (length:depth ratio, measured laterally <2.8). Gonocoxite length:width ratio 1.6–2.0. Distal margin of S8 with weakly developed medial process. Ventromedial area of hypandrium moderately constricted (*ca*. half width of lateral parts). Gonostylus shape moderately slender (viewed ventrally). Aedeagal terminal filaments moderately well developed, trifurcate. Gonostylus and gonocoxite of approximately equal length (viewed ventrally). Aedeagus straight, relatively short and laterally compressed. Epandrium distally bilobed.

Material examined: **Holotype**: SOUTH AFRICA: 1♂, 'South Africa: Natal / 10km S Dargle [29°29'S:29°59'E] / 26 March 1980 / JGH Londt'. **Paratypes**: SOUTH AFRICA: 2♀, same data as holotype.

Type locality: South Africa, KwaZulu-Natal, 10 km S. of Dargle.

Comments: The types were collected in long grass along the verge of a road. The species is only known from the type locality.

Gongromyia gen. n.

Type species: *Gongromyia bulla* sp. n. by monotypy and present designation.

Etymology: Gr. *Gongros* – swelling + *myia* – fly. Refers to the swollen appearance of the male S8.

Diagnosis: *Head*: Antennal style composed of three elements including terminal spine; postpedicel less than twice the length of scape; scape predominantly blackish. Facial gibbosity moderately well developed, occupying approximately half distance between lower facial margin and antennal sockets. Face relatively broad (width of head divided by width of face at same level <7). *Thorax*: Postpronotal lobe equipped with longish slender setae. Mesonotum with dorsocentral macrosetae reaching level of transverse suture (i.e. not extending anterior of suture). Scutellum usually with two marginal macrosetae. Metathoracic coxa with one lateral macroseta. Metathoracic femur with areas of black and yellow. *Abdomen*: Pruinescence extends uniformly over at least seven segments. Female cerci dorsally finely setose. Eighth sternum of male with a prominent distomedial process. Aedeagus bowed upwards. Hypandrium medially narrowed.

Note: See also illustrations, key and character matrix (Table 3) for morphological information.

Gongromyia bulla sp. n. (Figs 146–155)

Etymology: L. *bulla* – knob, refers to the posterior projection of the eighth sternum.

Diagnosis: *Head*: Antennal scape and pedicel blackish, pedicel with at most a narrow yellowish apex; postpedicel longer than stylus. *Thorax*: Postpronotal lobe with long setae. Dorsocentrals present both anterior and posterior to transverse suture. Microtrichia cover entire wing. Prothoracic femur with long, fine, hair-like posteroventral setae. Metathoracic coxa with one lateral macroseta; trochanter blackish; femur anteriorly yellow with brown-black markings and with yellow/white macrosetae. *Abdomen*: Ovipositor relatively short and broad (length:width ratio, measured dorsally <3.3) and relatively short and deep (length:depth ratio, measured laterally <2.8). Gonocoxite length:width ratio 1.6–2.0. Distal margin of S8 with well-developed medial process. Ventromedial area of hypandrium greatly constricted (*ca*. one quarter width of lateral parts). Gonostylus shape moderately slender (viewed ventrally). Aedeagal terminal filaments moderately well developed, trifurcate. Gonostylus and gonocoxite of approximately equal length (viewed ventrally). Aedeagus straight, relatively short and laterally compressed. Epandrium with ventral, subapical process.

Material examined: **Holotype**: SOUTH AFRICA: 1♂, 'S. Africa: E. Transvaal, 14km n. Sabie, Mac-Mac Pools 2430DD / xii 5, 1976 R. Miller'. **Paratypes**: SOUTH AFRICA: 5♂ 1♀, same data as holotype.

Type locality: South Africa, Mpumalanga, 14 km N. of Sabie, Mac-Mac Pools area.

Comments: The Mac-Mac pools are entirely surrounded by montane meadow, so it may be inferred that the species inhabits grassland. The species is known only from this locality.

Melouromyia gen. n.

Type species: *Heligmonevra natalensis* Ricardo, 1919, by present designation.

Etymology: Gr. *Melas* – black + *oura* – tail + *myia* – fly. Refers to the shiny black male genitalia of both known species.

Diagnosis: *Head*: Antennal style composed of three elements including terminal spine; postpedicel less than twice length of scape; scape predominantly blackish. Facial gibbosity moderately well developed, occupying approximately half distance between lower facial margin and antennal sockets. Face relatively broad (width of head divided by width of face at same level <7). *Thorax*: Postpronotal lobe equipped with longish, slender setae. Mesonotum with dorsocentral macrosetae extending anterior of transverse suture. Scutellum usually with two marginal macrosetae. Metathoracic coxa with one lateral macroseta. Metathoracic femur with areas of black and yellow. *Abdomen*: Pruinescence extends uniformly over at least seven segments. Female cerci dorsally finely setose. Ovipositor longish, laterally compressed for most of length. Epandrium of simple structure, totally lacking lobes and processes. Aedeagus more or less straight (apodeme, shaft and prongs lined up). Hypandrium medially narrowed.

Note: See also illustrations, key and character matrix (Table 3) for morphological information.

Key to species of *Melouromyia* gen. n.

Note: See character matrix (Table 4) for additional morphological information.

1 Wing membrane with microtrichia coverage that excludes the proximal end of cell r_5; genitalia as illustrated. Figs 164–172 .... **natalensis** (Ricardo, 1919)

– Wing membrane with more extensive microtrichia coverage that includes the proximal end of cell r_5; genitalia as illustrated. Figs 156–163 .... **diaphorus** sp. n.

Melouromyia diaphorus sp. n. (Figs 156–163)

Etymology: Gr. *diaphoros* – different, refers to the fact that the species differs from *natalensis*.

Diagnosis: *Head*: Antennal scape and pedicel blackish, pedicel with at most a narrow yellowish apex; postpedicel shorter than stylus. *Thorax*: Postpronotal lobe with long setae. Dorsocentrals present both anterior and posterior to transverse suture. Microtrichial coverage of wing fairly extensive in distal area (cell r_5 entirely covered). Prothoracic femur with long, fine, hair-like posteroventral setae. Metathoracic coxa with one lateral macroseta; trochanter dark red-brown to black; femur anteriorly yellow with brown-black markings and with dark red-brown to black macrosetae. *Abdomen*: Ovipositor relatively long and narrow (length:width ratio, measured dorsally >3.3) and relatively long and shallow (length:depth ratio, measured laterally >2.8). Gonocoxite length:width ratio 2.1–2.5. Distal margin of S8 lacking medial process or sclerotised area. Ventromedial area of hypandrium not markedly constricted. Gonostylus moderately slender (viewed ventrally). Aedeagal terminal filaments short and poorly developed. Gonostylus shorter than gonocoxite (viewed ventrally). Aedeagus straight, relatively short and laterally compressed. Epandrium simple (without obvious lobes or projections).

Material examined: **Holotype**: SOUTH AFRICA: 1♂, 'South Africa: 2429AA / Transvaal Uitkyk Rd / 10km N Potgietersrus / 28.i.1978 JGH Londt / Rocky side of koppie / grass trees and bush'. **Paratypes**: SOUTH AFRICA: 1♂ 1♀, 'South Africa: 2428BB / Transv. Drummondlea / 9km S Potgietersrus / 28.i.1978 JGH Londt / Grass under trees'; 3♂ 4♀ 1?, same data as holotype.

Type locality: South Africa, Limpopo Province, 10 km N. of Potgietersrus.

Comments: The types, known from only two localities some 20 km apart, were swept from grass within woodland (i.e. *Acacia* savannah).

Melouromyia natalensis (Ricardo, 1919) **Comb. n.** (Figs 164–172)

Heligmoneura natalensis Ricardo, 1919: 78–79.
Neomochtherus natalensis; Hull, 1962: 591; Tsacas, 1969:24–25; Hull, 1976: 260.
Pashtshenkoa natalensis; Lehr, 1996: 71.

Type material: **Syntype**: SOUTH AFRICA: 1♂ (seen), 'Type / H.T. / *natalensis*' [Poorly hand-written around circular red-bordered label], 'Presented / by / Cape Museum / 10. 2.19', 'Syntype / *Heligmoneura* / *natalensis* Ricardo / det. J.E. Chainey, 1985' [blue-edged circular syntype label glued to corner] (BMNH); 1♀ (seen), 'Type / *Helig. Natalensis*' [Poorly hand-written around circular red-bordered label], 'Karkloof, / Natal/ / Feb. 1897. / G.A.K. Marshall. / 1903-17.', 'Syntype / *Heligmoneura* / *natalensis* Ricardo / det. J.E. Chainey, 1985' [blue-edged circular syntype label glued to corner] (BMNH); 5♂ 6♀ 1? (seen), 'Mfongosi [28°42'S:30°48'E], Zulu L., iv (1♀) xii (1♂ 1♀) 1911, ii.1912 (1♀ 1?), 1914 (1♀), iv (1♂) v (1♂) xii (2♂ 2♀) 1916, W. E. Jones' (SAMC).

Lectotype designation: Ricardo (1919), as was her custom, designated both a male and a female as 'types'. I therefore consider all her specimens to be syntypes and believe that should it ever be desirable to designate a lectotype, her 'type' male (apparently previously labelled 'Marley Kloof, Natal', but now without locality label) would be the best choice. There is a defective syntype (lacking terminalia) in the BMNH from Kloof, that I have not seen. Ricardo recorded other specimens from 'Natal and Mfongosi, Zululand' which I have found in the SAMC collection. Details are as follows: 1♀, 'KKloof [Krantz Kloof] / Marley / Mar. 15' (SAMC); 1♀, 'Kloof / HWBM [H. W. Bell-Marley] / I-15' (SAMC); 5♂ 6♀ 1?, 'Mfongozi [28°42'S:30°48'E], / Zulu L. / W. E. Jones' Dates recorded are – iv.1911 (1♀) xii.1911 (1♂ 1♀) 11.1912 (1♀ 1?) 1914 (1♀) iv.1916 (1♂) v.1916 (1♂) xii.1916 (2♂ 2♀) (SAMC). I consider all these Ricardo-examined specimens to be syntypes.

Material examined: BOTSWANA: 5 km S.E. of Serowe, Farmers Brigade, SE2226BD.

MALAWI: Viphia, Chikangawa, SE1133DD. MOZAMBIQUE: Goba [3 localities – most likely is 26°11'59":S:32°08'18"E.]. SOUTH AFRICA: Wyllies Poort, 2229DD; Louis Trichardt [23°03'S:29°54'E], 4500 ft, (SAMC); Capricorn Private Nat Reserve, 2329CB; Pietersburg 23°54'S:29°27'E; Modjadji Nat Res, 23.38S 30.2020E; Vaalwater, SE2428Ab; Waterberg Mts, Heuningsfontein, 2428AD; Warm Baths, 2428CD; 10 km S.W. of Naboomspruit, 2428DA; 20 km N.E. of Potgietersrus, 2429AA; Tongwane falls [24°13'S:29°54'E]; Percy Fyfe Nat. Res., [24°11'S:29°01'E]; Marble Hall [24°58'S:29°18'E]; Ofcolaco 2430AB; Malta Forest [24°10'S:30°14'E]; 5 km N. of Strijdom Tunnels, 2430BC; Blyde River Canyon, 2430DB; Elandsfontein [24°37'S:30°46'E]; Britz Dist., Silkaatsnek (2527DB); Pretoria [25°45'S:28°10'E]; Loskopdam Nature Reserve area, 2529AD; Witbank [25°52'S:29°14'E; Mac Mac Falls Area, 2530BB; Sabie – Lourie Trail, 25°06'S:30°46'E, 900 m; 8 km N.W. Barberton on Badplaas Rd, SE2530DD; Barberton [25°55'S:31°07'E]; Lomati River Headwaters, 2531CC, 1175 m; Swartfontein, Vryburg, 26 54'S:24 45'E, 1240 m; Ferndale, Randburg [26°06'S:27°59'E]; Parys [26°54'S:27°27'E; Johannesburg [26°12'S:28°05'E]; Johannesburg, 2628Aa; Germiston [26°13'S:28°11'E; Carolina, SE2630Aa; Ntabambomvu Hills, Piggs Peak Road, 26°07'S:31°10'E; Ndumu Game Reserve, 2632CD; 3 km N. eManguzi, 2632Dd; Kosi Bay Nat. Res., 2632DD; 8 km N. Schweizer-Reneka, 27 09'S:25:15'E, 1350 m; Pongolo-bush Nat Res, 2730BC; Pongola Bush Nat Res, 27°21'S:30°26'E, 40 m; Ingwavuma [27°08'S:31°59'E]; False Bay Park Res, *ca.* 27°58'S:32°22'E; Mfongozi [28°42'S:30°48'E] (SAMC); Melmoth Dist., 28°38'S:31°27'E, 760[m]; Nkandhla Forest Res, 28°44'35"S:31°09'00"E, 1000 m; Kwanzimela Valley, nr Melmoth [28°37'S:31°27'E], 915 m; Eshowe, Dlinza Forest Reserve, 2831Cd, 450 m; Eshowe, 28°53'S:31°28'E; Entumeni Nature Res, 28°52'35"S:31°22'54"E, 720 m; 20 km S.E. Nkandla, 2831Ca; Hluhluwe Game Reserve, 28°04'S:32°02'E, 400 m; Hluhluwe Reserve [28°05'S:32°02'E]; Dukuduku [28°23'S:32°19'E]; Pietermaritzburg, 2930Cb; Pietermaritzburg, 29 34'S:30 20'E, 900 m; Town Bush Valley, 2930CB, 950 m; Pietermaritzburg, 29 30'S:30 26'E, 640 m; Pietermaritzburg, Athlone, 29°35'S:30°21'E, 960 m; Waterfall area, 29°45'S:30°51'E; Krantz'K [Krantskloof 29°45'S 30°51'E]; Kloof [29°47'S:30°50'E]; Amanzimtoti, 3030Ab; Ramsgate, 3030Cd; Unknown SA locality: Blinkwater. SWAZILAND: 1 km N. of Ngogolo, 26°07'S:31°10'E, 400 m; Mbabane [26°19'S:31°08'E]; 13 km N. of Ngogolo, 26°19'S:31°38'E, 300 m. ZIMBABWE: Matopos National Park, [20°33'S:28°33'E].

I have also seen the following specimens, here included in *natalensis*, which have the legs entirely yellowish: SOUTH AFRICA: 1♂ 1♀, Drummondlea, 2428BB, 9 km S. Potgietersrus, 28.i.1978, Londt, Grass under trees; 1♂, 35 km N.E. of Estcourt, Weenen N R [Nature Reserve], 28°52'S:30°00'E, 1100 m, 2–9.xii.1991, Perrin & Goddard, Malaise tr.; 1♀, Mhlopeni Nature Res, 15 km S.E. Muden, 2930AB, Londt, 4.ii.1984. Material not studied: 1♀, Hluhluwe Game Reserve, 18.4.1951, loc. No. 277, Brinck and Rudebeck (MZLU) (cited Hull, 1976).

Type locality: South Africa, KwaZulu-Natal, Kloof (a suburb near Durban). Although the male 'type' lacks a locality label, Ricardo states that it was collected 'from Marley Kloof, Natal'. As Marley, a well-known collector, collected in the Kloof area, and I have seen a specimen from Waterfall, a neighbouring area, Kloof can be accepted as the type locality. This area is now greatly transformed by urban sprawl, however, the nearby

Krantzkloof Nature Reserve is still likely to be a suitable habitat.

Comments: This species was placed in *Pashtshenkoa* by Lehr (1996). Although the male genitalia are superficially similar to those of other *Pashtshenkoa* species illustrated by Lehr, the aedeagal form is different, and until further comparisons are made I consider *natalensis* digeneric and have, therefore, separated the species (together with *diaphorus*) from *Pashtshenkoa* (which is primarily palaearctic) and placed it in a separate taxon. *M. natalensis* is widespread (Fig. 253) and appears to be associated with woodland habitats. A number of specimens have been collected in suburban gardens in Pietermaritzburg.

Notomochtherus gen. n.

Type species: *Notomochtherus brevicauda* sp. n., by monotypy and present designation.

Etymology: L. *Nota* – marks + *Mochtherus* (an asilid genus). Refers to the darkly pigmented venation.

Diagnosis: *Head*: Antennal style composed of three elements including terminal spine; postpedicel less than twice length of scape; scape predominantly blackish. Facial gibbosity moderately well developed, occupying approximately half distance between lower facial margin and antennal sockets. Face relatively broad (width of head divided by width of face at same level <7). *Thorax*: Postpronotal lobe equipped with longish slender setae. Mesonotum with dorsocentral macrosetae extending anterior of transverse suture. Scutellum usually with two marginal macrosetae. Metathoracic coxa with three or four weakish macrosetae. Metathoracic femur blackish. *Abdomen*: Pruinescence extends uniformly over at least seven segments. Female cerci dorsally finely setose. Ovipositor broader than deep. Aedeagus bowed upwards. Hypandrium medially well-developed (wide, slightly constricted).

Note: See also illustrations, key and character matrix (Table 3) for morphological information.

Notomochtherus brevicauda sp. n. (Figs 173–182)

Etymology: L. *brevis* – short + *cauda* – tail, refers to the short or truncate male terminalia.

Diagnosis: *Head*: Antennal scape and pedicel blackish, pedicel with at most a narrow yellowish apex; postpedicel longer than stylus. *Thorax*: Postpronotal lobe with long setae. Dorsocentrals present both anterior and posterior to transverse suture. Microtrichial coverage of wing fairly extensive in distal area (cell r_5 entirely covered). Prothoracic femur with long, fine, hair-like posteroventral setae. Metathoracic coxa with two lateral macrosetae; trochanter dark red-brown to black; femur entirely blackish (may have slightly paler ends) and yellow/white anterior macrosetae. *Abdomen*: Ovipositor relatively short and broad (length:width ratio, measured dorsally <3.3) and relatively short and deep (length:depth ratio, measured laterally <2.8). Gonocoxite length:width ratio 1.6–2.0. Distal margin of S8 lacking medial process or sclerotised area. Ventromedial area of hypandrium not markedly constricted. Gonostylus moderately slender (viewed ventrally). Aedeagal terminal filaments moderately well developed, trifurcate. Gonostylus shorter than gonocoxite (viewed ventrally). Aedeagus straight, relatively short and laterally compressed. Epandrium distally bilobed.

Material examined: **Holotype**: SOUTH AFRICA: 1♂, 'Greyton / S. A. Museum' ~

'Mus Staff / Jan 1940' (SAMC). **Paratype**: SOUTH AFRICA: 1♀, data as for holotype.
Type locality: South Africa, Western Cape, Greyton.
Comments: The species has a number of apparent autapomorphies (see Table 4) and is therefore given generic status. Although the type material is not in the best condition it is clear that this species is markedly different from others included in this study – the darkly marked wings and truncate appearance of the male terminalia are conditions considered particularly diagnostic. The species is known only from the type locality.

Sphagomyia gen. n.

Type species: *Sphagomyia botswana* sp. n., by present designation.
Ethology: Gr. *Sphagios* – slaying + *myia* – fly. Refers to the predatory habit of these flies.
Diagnosis: *Head*: Antennal style composed of three elements including terminal spine; postpedicel less than twice the length of scape; scape predominantly yellowish. Facial gibbosity moderately well developed, occupying approximately half distance between lower facial margin and antennal sockets. Face relatively broad (width of head divided by width of face at same level <7). *Thorax*: Postpronotal lobe equipped with longish slender setae. Mesonotum with dorsocentral macrosetae reaching level of transverse suture (i.e. not extending anterior of suture). Scutellum usually with two marginal macrosetae. Metathoracic coxa with one lateral macroseta. Metathoracic femur with areas of black and yellow. Metathoracic femur yellowish with blackish areas or uniformly yellowish. *Abdomen*: Pruinescence extends uniformly over at least seven segments. Female cerci dorsally finely setose. Epandrium with a dorsomedial process. Gonostylus elongate and much longer than gonopods. Aedeagus bowed downwards distally, with minute distal prongs. Hypandrium medially narrowed.
Note: See also illustrations, key and character matrix (Table 3) for morphological information.

Key to species of *Sphagomyia* gen. n.

Note: See character matrix (Table 4) for additional morphological information.

1 Antennal scape and femora yellowish. Figs 183–191 .... **botswana** sp. n.
– Antennal scape dark red-brown; femora largely brownish anteriorly. Figs 192–198 **kenya** sp. n.

Sphagomyia botswana sp. n. (Figs 183–191)

Etymology: Named after the country of Botswana where most of the type specimens were collected.
Diagnosis: *Head*: Antennal scape and pedicel yellowish; postpedicel shorter than stylus. *Thorax*: Postpronotal lobe with long setae. Dorsocentrals present only posterior to transverse suture. Microtrichial coverage of wing moderate in distal area (proximal tip of cell r_5 bare). Prothoracic femur with long, fine, hair-like posteroventral setae only. Metathoracic coxa with one lateral macroseta; trochanter brownish yellow; femur entirely yellowish or brownish with dark red-brown to black macrosetae. *Abdomen*: Ovipositor relatively short and broad (length:width ratio, measured dorsally <3.3) and relatively long and shallow (length:depth ratio, measured laterally >2.8). Gonocoxite length:width

ratio <1.6. Distal margin of S8 lacking medial process or sclerotised area. Ventromedial area of hypandrium greatly constricted (*ca*. one quarter width of lateral parts). Gonostylus clearly attenuate with knobbed distal end. Aedeagal terminal filaments tiny and poorly developed. Gonostylus longer than gonocoxite (viewed ventrally). Aedeagus straight, relatively short and laterally compressed. Epandrium with distinctive dorsal process/ lobe.

Material examined: **Holotype**: BOTSWANA: 1♂, 'Malaise trap / Serowe; Botswana / Forchhammer Leg. / Date 2-xi/1983'. **Paratypes**: BOTSWANA: 3♂ 1♀, 'Botswana SE2226BD / Farmers Brigade 5km / SE of Serowe Hillside / N Slope. P Forchhammer / Malaise trap' [basic label – date and trap number as follows] x-85 MT 3 (1♂), xi-85 trap 1 (1♂), xi-85 trap 3 (1♂), xii.1985 trap 1 (1♀); 1♀, 'Malaise trap / Serowe; Botswana / Forchhammer Leg. / Date 19-x/1983'; 1♂, 'Botswana / Serowe / M.T. 6 xi-87'; 5♂, 'Botswana SE2226BD / Serowe. Farmer's / Brigade. Malaise trap. Forchhammer' [basic label – date and trap number as follows] x-88 trap 8 (3♂), xi-88 trap 9 (2♂). SOUTH AFRICA: 1♂, 'South Africa. Transvaal / Kruger Park 9-xii-1972 / Shongile borehole nr Letaba / tree trunks & water edge / Stuckenberg family 2331Cd'; 1♂, 'Potgieters / Rust [Potgietersrus 24°11'S:29°01'E], Tvl.' ~ 'G. M. Melle / Oct. 1920' (SAMC).

Type locality: Botswana, Serowe (probably Farmer's Brigade farm).

Comments: *Sphagomyia* has an epandrium resembling illustrations provided by Lehr (1996) of his monotypic, palaearctic *Leleyellus* Lehr, 1996. This may be a case of convergence. *P. botswana* may be separated from *kenya* on features of the genitalia and coloration of the legs.

Sphagomyia kenya sp. n. (Figs 192–198)

Etymology: Named after the country of Kenya where the type specimens were collected.

Diagnosis: *Head*: Antennal scape and pedicel blackish, pedicel with at most a narrow yellowish apex; postpedicel shorter than stylus. *Thorax*: Postpronotal lobe with long setae. Dorsocentrals present only posterior to transverse suture. Microtrichial coverage of wing moderate in distal area (proximal tip of cell r_5 bare). Prothoracic femur with long, fine, hair-like posteroventral setae only. Metathoracic coxa with one lateral macroseta; trochanter brownish yellow; femur yellow with brown-black markings with black and yellow/white macrosetae. *Abdomen*: Ovipositor relatively short and broad (length:width ratio, measured dorsally <3.3) and relatively short and deep (length:depth ratio, measured laterally <2.8). Gonocoxite length:width ratio <1.6. Distal margin of S8 undulating, but lacking medial process or sclerotised area. Ventromedial area of hypandrium greatly constricted (*ca*. one quarter width of lateral parts). Gonostylus clearly attenuate and distally knobbed. Aedeagal terminal filaments short and poorly developed. Gonostylus longer than gonocoxite (viewed ventrally). Aedeagus straight, relatively short and laterally compressed. Epandrium with characteristic dorsal process/ lobe.

Material examined: **Holotype** KENYA: 1♂, 'Kenya Eastern / Katulani [01°32'S:37°38'E] Kitui dist. / malaisetrap 26.x.1990 / J. A. M. Jansen'. **Paratypes**: KENYA: 2♂ 3♀, same data as holotype.

Type locality: Kenya, Katulani.

Comments: Very similar to *botswana* but separable using leg coloration and genital characteristics.

Tsacasiella Lehr, 1996

Tsacasiella Lehr, 1996: 72. Type-species: *Heligmonevra neavei* Ricardo, 1919, by original designation.

Diagnosis: *Head*: Antennal style composed of three elements including terminal spine; postpedicel less than twice as long as scape; scape predominantly yellowish. Facial gibbosity weak, occupying less than half distance between lower facial margin and antennal sockets. Face relatively broad (width of head divided by width of face at same level <7). *Thorax*: Postpronotal lobe equipped with longish slender setae. Mesonotum with dorsocentral macrosetae extending anterior to transverse suture. Scutellum usually with two marginal macrosetae. Trochanters usually yellowish. Metathoracic coxa with one lateral macroseta. Metathoracic femur primarily yellowish. *Abdomen*: Pruinescence extends uniformly over at least seven segments. Female cerci dorsally finely setose. Hypopygium greatly elongate. Epandrium usually with small ventrodistal process. Gonocoxites and gonostyli narrowly elongate. Aedeagus elongate, more or less straight. Hypandrium medially narrowed.

Note: See also illustrations, key and character matrix (Table 3) for morphological information.

Key to species of *Tsacasiella* Lehr, 1996.

Notes:

- Key adapted from that published by Tsacas (1969).
- See character matrix (Table 4) for additional morphological information.

1 Metathoracic femur unicolorous, yellowish or reddish, only the distal tip or anterior face may be very slightly darker 2

– Metathoracic femur with at least a medial brownish band or marking anteriorly; Genitalia as illustrated (Tsacas (1969) Figs 69–74) .... **kivuensis** Tsacas, 1969

2 Wing with microtrichial coverage only distally and along posterior margin (i.e. cell r_5 proximally bare) 3

– Wing almost entirely covered with microtrichia 4

3 Epandrium slender with ventrodistal lobe pointed and better developed than dorsodistal lobe (Fig. 205). Figs 203–209 .... **futilis** Tsacas, 1969

– Epandrium less slender with ventrodistal and dorsodistal lobes rounded and of almost equal development (Fig. 212). Figs 210–216 .... **inornata** sp. n.

4 At least a few dorsal postocular macrosetae black 6

– Dorsal postocular macrosetae yellow 5

5 Dorsocentral macrosetae extending anterior of transverse suture; setae between/among dorsocentrals and in front of scutellum pale in colour; genitalia as illustrated (Tsacas (1969) Figs 83–89) .... **neavei** Ricardo, 1919

– Dorsocentral macrosetae confined to area posterior to transverse suture; setae between/among dorsocentrals and in front of scutellum black; epandrium as illustrated (Figs 199–200) (see also Tsacas (1969) Figs 19–25) .... **blanda** Tsacas, 1969 (= *callipygus* Tsacas, 1969)

6 Setae between dorsocentrals and in front of scutellum white; T8 shiny apruinose; Genitalia as illustrated (Figs 219–223) .... **instabilis** Tsacas, 1969

– Setae between dorsocentrals and in front of scutellum black; T8 not shiny, pruinose 7

7 Prothorax with both black and pale macrosetae; epandrium as illustrated (Fig. 201) (see also Tsacas (1969) Figs 33–39) .... **debilis** Tsacas, 1969
Prothorax with pale macrosetae only; epandrium as illustrated (Fig. 202) (see also Tsacas (1969) Figs 40–46) .... **exilis** Tsacas, 1969

Tsacasiella blanda (Tsacas, 1969) (Figs 199–200)

Neomochtherus blandus Tsacas, 1969: 11–12.
Neomochtherus callipygus Tsacas, 1969:12–13. **Syn. n.**
Tsacasiella blandus; Lehr, 1996: 72.
Tsacasiella callipygus; Lehr, 1996: 73.

Type material: **Holotype**: DR CONGO: 1♂, [*blanda* seen], 'Holotypus', 'Coll. Mus. Congo / Bas-Congo: Kalina [04°18'S:15°16'E] / viii-1945 / Mme Delsaut', '*Neomochtherus* / *neavei* Ricardo / det. H. Oldroyd 1966', '*Neomochtherus* / *blandus* n.sp. / Holotype ♂ / L. Tsacas det. 1967' (MRAC); **Allotype**: DR CONGO: 1♀ [not seen] same data as holotype. **Holotype**: RWANDA: 1♂ [*callipygus* seen], 'Holotypus', 'Musée du Congo / Kagera [01°38'S:29°34'E]: Gahinga / (Ruanda) 26-iv-1937 / H. J. Brédo', '*Neomochtherus* / *callipygus* n.sp. / Holotype ♂ / L. Tsacas det. 1967' (MRAC); **Paratype**: DR CONGO: 1♂ [*callipygus* not seen], Kagera, Gahinga, 29.iv.1937, H. J. Bredo (MRAC).
Type locality: Democratic Republic of the Congo, Kalina.
Synonymy of *callipygus*: A study of the type material together with the descriptions provided by Tsacas (1969), leads me to believe that *callipygus* is a synonym of *blanda*.
Comments: As mentioned under Materials and Methods, the holotype of *blanda* is badly damaged and now lacks both antennae, right wing and four legs (only the left fore- and right hind-leg remain intact). The holotype of *callipygus*, sent in the same box as the *blanda* type (and three other types) was even more badly damaged. All that remained attached to the pin was the thorax, head (minus antennae) and part of one fore-leg (right femur and tibia). Fortunately the genitalia vials attached to the pins were not dislodged. After sorting through the fragments found in the box I was able to identify portions of both wings and a piece of abdomen which appear to belong to the *callipygus* specimen; these were placed in a gelatine capsule, pinned and appropriately labelled alongside the type specimen. None of the many broken fragments could be confidently associated with the *blanda* type specimen, and so an empty capsule with appropriate label has been placed alongside this type. Fortunately there are other specimens in the type series that were not sent to me that remain intact. No new material representing these taxa were found during this study.

Tsacasiella debilis (Tsacas, 1969) (Fig. 201)

Neomochtherus debilis Tsacas, 1969:14-15.
Tsacasiella debilis; Lehr, 1996:73.

Type material: **Holotype**: DR CONGO: 1♂ [seen], 'Holotypus', 'Musée du Congo / Sankuru: Komi [03°29'S:23°19'E] / iv-1930 / J. Ghesquière', '*Neomochtherus* / *debilis* n.sp. / Holotype ♂ / L. Tsacas det. 1967' (MRAC); **Allotype**: DR CONGO: 1♂ [not seen], Sankuru, Komi, vii.1930, J. Ghesquière (MRAC); **Paratypes**: DR CONGO: 2♂ [not seen], Sankuru, Komi, 17.iv.1930 & iv.1930, J. Ghesquière (MRAC MNHN).
Type locality: Democratic Republic of Congo, Komi.

Comments: The holotype of *debilis* was amongst the five damaged types previously discussed. All that remains on the pin is the legless thorax and four attached abdominal segments. Placed in a capsule, pinned and labelled separately from the type, are a head, without antennae, and fragments of both wings believed to belong to the specimen. Fortunately the genitalia vial remained attached to the specimen pin. No new material representing this species was found during this study.

Tsacasiella exilis (Tsacas, 1969) (Fig. 202)

Neomochtherus exilis Tsacas, 1969:15–16.
Tsacasiella exilis; Lehr, 1996:73.

Type material: **Holotype**: DR CONGO: 1♂ [seen], 'Holotypus', 'Musée du Congo / Elisabethville / Lubumbashi [11°40'S:27°28'E] 28-vi-1920 / Dr M. Bequaert', '*Neomochtherus* / *neavei* Ricardo / det. H. Oldroyd 1966', '*Neomochtherus* / *exilis* n.sp. / Holotype ♂ / L. Tsacas det. 1967' (MRAC).
Type locality: Democratic Republic of Congo, Lubumbashi.
Comments: The holotype of *debilis* was amongst the five damaged types (see above). No new material representing this species was found during this study.

Tsacasiella futilis (Tsacas, 1969) (Figs 203–209)

Neomochtherus futilis Tsacas, 1969: 16–18.
Tsacasiella futilis; Lehr, 1996: 73.
Neomochtherus notatus Tsacas, 1969:27–28. **Syn. n.**

Type material: DR CONGO: **Holotype** 1♂, **allotype** 1♀, **paratypes** 6♂ 11♀ [*futilis* not seen]: Kadjudju, Lac Kivu [0200S:2910E], Congo (Kinshasa), Aout (MNHN); **Paratype**: 1♂, [*futilis* seen], 'Mai | Juin', 'Congo Belge / Rég. Lac Kivu / Kadjudju', 'Muséum Paris / 1932 / G. Babault', 'Paratype', '*Neomochtherus* / *futilis* n. sp. / L. Tsacas Det. 1966' (NMHN); **Paratype**: 1♂ [*futilis* seen], 'Aout', 'Congo Belge / Rég. Lac Kivu / Kadjudju', 'Muséum Paris / Congo Belge / Guy Babault 1929', 'Paratype', '*Neomochtherus* / *futilis* n. sp. / L. Tsacas Det. 1965' (NMHN). **Holotype**: DR CONGO: 1♂ [*notatus* seen], 'Congo Belge / Rég. Lac Kivu / Kadjudju', 'Muséum Paris / 1932 / G. Babault', 'Type', '*Neomochtherus* / *notatus* n. sp. / Holotype ♂ / L. Tsacas Det. 1967' (NMHN).
Material examined: KENYA: 1♂, Nakuru, Hell's Gate Nat. Park, 00°57'S:36°19'E, 1900 m, 26.xi.1992, Whittington & Londt, Ngorowa Gorge, stream.
Material not studied: ZAMBIA: 2♀, Lealui [1513S:2302E] (MNHN – reported by Tsacas 1969).
Type locality: Democratic Republic of Congo, Kadjudju.
Comments: The holotype specimen of *notatus* has its abdomen completely broken off. However, part of an abdomen is stuck to a card beneath the specimen, and the genitalia (removed from this abdomen) placed in a small glass genitalia vial pinned beneath the specimen. It is obvious that this abdomen and the associated genitalia were incorrectly associated with the specimen which was clearly one of the series used to describe *futilis*. It is not known to which species the abdomen belongs, but the damaged (dermestid damaged ?) genitalia, illustrated by Tsacas (1969), suggest a species belonging to an entirely different genus (the probable reason why Tsacas (1969) could not group the species and Lehr (1996) chose to ignore it). I have no hesitation in listing *notatus* as a synonym of *futilis*.

Tsacasiella inornata sp. n. (Figs 210–216)

Etymology: L. *inornatus* – unadorned, refers to the absence of the small ventrodistal epandrial projection found in all other species of the genus.

Diagnosis: *Head*: Antennal scape and pedicel yellowish; postpedicel shorter than stylus. *Thorax*: Postpronotal lobe with long setae. Dorsocentrals present both anterior and posterior to transverse suture. Microtrichial coverage of wing moderate in distal area (proximal tip of cell r_5 bare). Prothoracic femur with long, fine, hair-like posteroventral setae. Metathoracic coxa with one lateral macroseta; trochanter brownish yellow; femur anteriorly yellow with brown-black markings and dark red-brown to black macrosetae. *Abdomen*: Ovipositor relatively long and narrow (length:width ratio, measured dorsally >3.3) and relatively long and shallow (length:depth ratio, measured laterally >2.8). Gonocoxite length:width ratio: 2.1–2.5. Distal margin of S8 lacking medial process or sclerotised area. Ventromedial area of hypandrium moderately constricted (*ca.* half width of lateral parts). Gonostylus moderately slender (viewed ventrally). Aedeagal terminal filaments minute. Gonostylus shorter that gonocoxite (viewed ventrally). Aedeagus straight, relatively short and laterally compressed. Epandrium with poorly defined ventrodistal and dorsodistal lobes, these being rounded and almost equally developed.

Material examined: **Holotype**: NAMIBIA: 1♂, 'Namibia 21.iii.1984 / 21km SW Grootfontein / Rd 8/1 19 41'S:17 58'E / Londt & Stuckenberg / Mixed woodland on the / slopes of a hill'. **Paratypes**: BOTSWANA: 2♂ 2♀, 'Botswana SE2226BD / Farmers Brigade 5km / SE of Serowe Hillside / N Slope P Forchhammer' [basic label – plus date and other data as follows] 16-v-1984 Malaise trap 1 (1♂), 19-iii-1985 Malaise Trap 2 (1♀), Malaise Trap 2 iii.1986 (1♀), iv.1986 Malaise trap 2 (1♂); 5♂ 4♀, 'Botswana SE2226BD / Serowe Farmer's / Brigade. Malaise / trap Forchhammer / iv.89 (1♀), i.90 (1♂), iii.90 (1♂ 1♀), iv.90 (1♂ 1♀), iv.92 (2♂ 1♀); 4♂ 4♀, 'Botswana: Serowe #66 / Farmers Brigade / 22 25'S:26 44'E 1000m / Date: ii.91 (1♂), iii.91 (2♂ 3♀), v. 91 (1♂ 1♀) / P Forchhammer / Malaise Trap'; 6♂ 2♀, 'Botswana: Serowe #104 / Farmers Brigade / 22 25'S:26 44'E 1000m / Date: iv. 1991 / P Forchhammer / Malaise Trap'. MALAWI: 1♂ 1♀, 'Malawi SE1435AC / 25km N of Mangochi / 1km S Club Makokola / 11.iii.1987 J Londt / Grass & thick bush'. NAMIBIA: 2♂ 1?, 'Namibia – Exp. ZMB 1992 / Kavango: Mahango Game / Reserve 18°17'S / 21°43'E / lux, 2.iii.92, leg. W. Mey' (ZMHB); 2♂, 'Namibia: Mahango / Game Reserve / 1-5.iii.1994 / leg. F. Koch' (ZMHB); 1♂, 'Namibia 22.iii.1984 / 20km NW Grootfontein / Rd 72 19 28'S:17 58'E / Londt & Stuckenberg / Roadside grass and / in sandy area'; 1♀, 'Namibia 21.iii.1984 / 15km NE Grootfontein / J Scribante Skietbaan / Rd 9/2 19 28'S:18 15'E / Stuckenberg & Londt / Grassy road verges'; 1♂ 1♀, same data as holotype. ZIMBABWE: 1♀, 'Victoria Falls [17°55'S:25°21'E] / Rain Forest / 5.v.1954 / AJT Janse'; 1♂, 'Wankie [19°10'S:26°30'E] S.R. / 15m South / 30.iv.1954 / AJT Janse'.

Type locality: Namibia, 21 km S.W. Grootfontein.

Comments: Although most of the types are from Botswana, the species is known from four different countries.

Tsacasiella instabilis (Tsacas, 1969) (Figs 217–223)

Neomochtherus instabilis Tsacas, 1969: 19–21.
Tsacasiella instabilis; Lehr, 1996: 73.

Type material: **Holotype**: DR CONGO: 1♂ [seen], 'Holo- / type', 'Kambove, [10°52'S:26°35'E] / Katanga. / 2.4.07 / 4,000 – 5,000 ft.', 'Neave Coll / 1907-230', '*Neomochtherus* / *instabilis* n.sp. / Holotype M / L. Tsacas Det 1967' (BMNH).
Material examined: MALAWI: 2♂ 2♀, 80 km S. of Mzimba, SE1233BC, 27.ii.1987, J. & A. Londt, Long grass & trees near Luwelezi river.
Type locality: Democratic Republic of Congo, Kambove.
Comments: Although the Malawi material bears a strong resemblance to the holotype, especially with respect to the male genitalia, minor differences, considered to represent individual variation, do exist. Far more new material is required before a good understanding of the species can be achieved.

Tsacasiella kivuensis (Tsacas, 1969).

Neomochtherus kivuensis Tsacas, 1969: 21–22.
Tsacasiella kivuensis; Lehr, 1996: 73.

Type material: DR CONGO: **Holotype** 1♂, **allotype** 1♀, **paratypes** 2♀ [not seen], Kadjudju, région du lac Kivu [0200S:2910E], aoùt 1932, G. Babault (MNHN); **Paratypes**: DR CONGO: 1♂ 1♀ [seen], 'Kadjudju / Region du Kivu / Congo Belge G. Babault rec. 1932', 'Muséum Paris', 'Paratype' (red), '*Neomochthe- / rus* / *kivuensis* n. sp. / L. Tsacas Det. 1968' (MNHN).
Type locality: Democratic Republic of Congo, Kadjudju.
Comments: Although collected at the same locality as *T. futilis*, *kivuensis* is somewhat different. This is the only species of *Tsacasiella* with dark trochanters and brown-marked femora. These features may suggest a relationship with the two South African species of *Caenoura*, but the male genitalia are typical of *Tsacasiella* species.

Tsacasiella neavei (Ricardo, 1919).

Heligmoneura neavii Ricardo, 1919: 76–77.
Neomochtherus neavei; Hull, 1962: 591; Tsacas, 1969: 26–27.
Tsacasiella neavei; Lehr, 1996: 73.

Note: *neavii* is an incorrect spelling of *neavei* (see below).
Type material: **Syntypes**: ZAMBIA: 1♂ 1♀ [seen], 'Type', 'NE Rhodesia. / Vy [= Valley] of Chambezi. [10°16'S:33°01'E] / 4,000 ft. / 16.v.1908 (♀) 18.v.1908 (♂) / S.A. Neave', 'Syntype / *Heligmoneura* / *neavei* Ricardo / det. J.E. Chainey, 1985' (BMNH); **Syntypes**: 1♂ 2♀ 1? [not seen], Lualaba River [two sets of co-ordinates available 14°02'S:27°50'E & 12°46'S:25°46'E. Note: not 'Sualaba' as cited by Ricardo], 2500–4000 ft, 19.iv.1907, S. E. Neave (BMNH). **Syntype**: DR CONGO: 1♂ [not seen], Kambove, Katanga (BMNH).
Lectotype designation: Ricardo (1919) did not designate a holotype and so I consider all her material to be syntypes. Should a lectotype desination ever be considered necessary, the male 'type' would be the most suitable specimen. While I have not seen Ricardo's material from Sualaba River, and do not know how many specimens there are, these must also be considered syntypes. At least one of Ricardo's 'males from Kambove, Katanga, 4000–5000, 2.4.07, (S. A. Neave)' (BMNH), also

originally a syntype of *neavei*, is now the holotype of *T. instabilis* (Tsacas, 1969). John Chainey (BMNH) has informed me that there is 1♂ syntype of *neavei* from Kambove in the BMNH. Although this is presently considered a syntype of *neavei* it is still necessary to determine if this specimen should also to transferred to *T. instabilis*.

Material examined: Those indicated above as having been seen.

Material not studied: Tsacas (1969) includes 'Congo (Kinshasa)' in his section on geographical distribution. I am, however, unable to confirm this information. *T. futilis* is also known from Kinshasa and so some confusion may exist.

Type locality: Zambia, Chambesi.

Comments: Ricardo's (1919) original published spelling of the specific name was *neavii*. However, all subsequent authors correctly used the spelling *neavei*. No new specimens were found during the study.

Valiraptor gen. n.

Type species: *Valiraptor silvestris* sp. n., by present designation.

Etymology: L. *Validus* – strong + *raptor* – robber, plunderer. Refers to the relatively robust appearance of the species.

Diagnosis: *Head*: Antennal style composed of three elements including terminal spine; postpedicel less than twice the length of scape; scape predominantly blackish. Facial gibbosity moderately well developed, occupying approximately half distance between lower facial margin and antennal sockets. Face relatively broad (width of head divided by width of face at same level <7). *Thorax*: Postpronotal lobe equipped with longish slender setae. Mesonotum with dorsocentral macrosetae extending anterior of transverse suture. Scutellum usually with two marginal macrosetae. Metathoracic coxa with one lateral macroseta. Metathoracic femur with areas of black and yellow. *Abdomen*: Pruinescence extends uniformly over at least seven segments. Female cerci dorsally finely setose. Aedeagal shaft strongly curved and exceptionally long, this development giving terminal abdominal segments a characteristic deep, laterally compressed appearance. Aedeagal prongs exceptionally long and frequently coiled. Hypandrium; medially well developed (wide, not constricted).

Note: See also illustrations, key and character matrix (Table 3) for morphological information.

Key to species of *Valiraptor* gen. n.

Note: See character matrix (Table 4) for additional morphological information.

1 Antennal scape dark red-brown; mystax with a number of blackish macrosetae; dorso-central macrosetae extend anterior of transverse suture; wing membrane extensively covered with microtrichia (i.e. r_5 entirely covered); metathoracic femora with distinct dark red-brown markings 2

– Antennal scape yellowish; mystax composed entirely of yellowish macrosetae; dorso-central macrosetae do not extend anterior of transverse suture; wing membrane with microtrichia largely confined to distal and posterior parts of the wing (i.e. r_5 lacking microtrichia proximally); metathoracic femora fairly uniformly yellow-brown without distinct dark red-brown markings 3

2 Face gold pruinose, mystax with yellow macrosetae above epistomal margin; trochanters yellowish; metathoracic femora usually with a mixture of black and yellowish macrosetae anteriorly; genitalia as illustrated. Figs 236–243 .... **silvestris** sp. n.

– Face silver pruinose, mystax with white macrosetae above epistomal margin; trochanters dark red-brown; metathoracic femora with yellowish macrosetae only; genitalia as illustrated. Figs 224–230 .... **montanus** sp. n.

2 Antennal postpedicel longer than stylus; metathoracic femora with dark brown macrosetae anteriorly; katetergal macrosetae mostly dark red-brown; genitalia as illustrated. Figs 244–248 .... **vittatus** sp. n.

– Antennal postpedicel and stylus of about equal length; metathoracic femora with yellowish macrosetae anteriorly; katetergal macrosetae yellowish; genitalia as illustrated. Figs 231–235 .... **namibiensis** sp. n.

Valiraptor montanus sp. n. (Figs 224–230)

Etymology: L. *montanus* – of mountains, refers to the fact that much of the material has been collected from montane areas.

Diagnosis: *Head*: Antennal scape and pedicel blackish, pedicel with at most a narrow yellowish apex; postpedicel longer than stylus. Face silver pruinose; mystax with white macrosetae above epistomal margin. *Thorax*: Postpronotal lobe with long setae. Dorsocentrals present both anterior and posterior to transverse suture. Microtrichial coverage of wing fairly extensive in distal area (cell r_5 entirely covered). Prothoracic femur with long, fine, hair-like posteroventral setae. Metathoracic coxa with one lateral macroseta; trochanter dark red-brown to black; femur anteriorly yellow with brown-black markings and yellow/white macrosetae. *Abdomen*: Ovipositor relatively short and broad (length:width ratio, measured dorsally <3.3) and relatively short and deep (length:depth ratio, measured laterally <2.8). Gonocoxite length:width ratio >2.5. Distal margin of S8 weakly sclerotised and lacking medial process or sclerotised area. Ventromedial area of hypandrium not markedly constricted. Gonostylus clearly attenuate (viewed ventrally). Aedeagal terminal filaments well developed and filamentous. Gonostylus longer than gonocoxite (viewed ventrally). Aedeagus strongly curved, greatly elongate and tubular. Epandrium simple (without obvious lobes or projections).

Material examined: **Holotype**: SOUTH AFRICA: 1♂, 'RSA: KZ-Natal #12 / Loteni Nature Reserve / 29°28'S:29°32'E 1470m / Date: 21.ii.1996 / Coll: J & A Londt / Cool Pools area Grass'. **Paratypes**: SOUTH AFRICA: 1♂, 'Sth Africa Transvaal / Cycad Trail / Dist. Middelburg [25°47'S:29°28'E] / R Elferink 3.i.1983'; 3♂ 7♀, 'South Africa: Natal / Itala Nature Reserve / 2km N Louwsburg / 20.ii.1979 2731CA / JGH Londt Rocky / area at park gate'; 1♂ 1♀, 'S Africa: Natal #97 / Itala Game Reserve / Craig Adam Dam / 27°28'S:31°25'E / ii.1991 R Miller / Malaise trap'; 1♀, 'S Africa: Natal #98 / Itala Game Reserve / Craig Adam Dam / 27°28'S:31°25'E / iii.1991 R Miller / Malaise trap'; 1♂ 1♀, 'S Africa: Natal #36 / Royal Natal Nat Park / 28°41'S:28°56'E 1440m / Date: 23-28.iii.1991 / Coll: JGH Londt / Caravan Park environs'; 2♀, 'South Africa: Natal / Royal Natal Nat Park / 28°41'S:28°59'E / JGH Londt 18.iii.1989 / Tiger Falls area'; 4♂, 'South Africa: Natal / Cathedral Peak area / 2829CC 7–12 April 1982 / JGH Londt ex Malaise'; 1♂ 1♀, 'South Africa: Natal / Cathedral Peak area / 2829Cc

16-18.xii.1977 / JGH Londt ex Malaise'; 2♂, 'Cathedral Peak / Forestry Reserve / Natal Drakensberg / March 1959 / BR & PJ Stuckenberg', 'Little Berg Summits / *Themeda* grassland / 5500–6000 ft'; 4♂ 1♀, 'RSA: KZ-Natal #20 / Mpati Mountain Dundee / 28°08'S:30°13'E 1590m / Date: 19.iii.1997 / Coll: JGH Londt / Summit grass & bush'; 1♀, 'South Africa: Natal / Giants Castle G. Res. / 2929AD 16.ii.1983 / D. Barraclough / Montane grassland'; 3♂ 1♀, same data as holotype; 1♀, 'RSA: KZ-Natal #8 / Loteni Nature Reserve / 29°27'S:29°32'E 1500m / Date: 20.ii.1996 / Coll: J & A Londt / Jacob's Ladder Falls'; 3♂ 1♀, 'RSA; KZ-Natal #5 / Garden Castle Nat Res / 29°44'S:29°14'E 1740m / Date: 17.ii.1996 / Coll: JGH Londt / Thukelana River 3 Pools'; 1♂ 1♀, 'South Africa: Natal / Garden Castle Nat Res / Hotel area ca. 1800m / 29°45'S:29°15'E / JGH Londt 6-11.i.1988 / Grassveld near stream'; 1♂ 1♀, 'near Lilani [29°07'S:30°51'E] / Ahrens district / Natal, S. Africa / B & P Stuckenberg / April 1962'.

Type locality: South Africa, KwaZulu-Natal, Loteni Nature Reserve.

Comments: A species similar to *silvestris*, but smaller and with different genitalia. All but one specimen are from KwaZulu-Natal and most of the localities are montane (Fig. 254). The species inhabits moist grassland.

Valiraptor namibiensis sp. n. (Figs 231–235)

Etymology: Named after the country of Namibia.

Diagnosis: *Head*: Antennal scape and pedicel yellowish; postpedicel and stylus of similar length. *Thorax*: Postpronotal lobe with long setae. Dorsocentrals posterior to transverse suture only. Microtrichial coverage of wing moderate in distal area (proximal tip of cell r_5 bare). Prothoracic femur with long, fine, hair-like posteroventral setae. Katetergal macrosetae yellowish. Metathoracic coxa with one lateral macroseta; trochanter brownish yellow; femur anteriorly entirely yellowish or light brownish with yellow/white macrosetae. *Abdomen*: Gonocoxite length:width ratio >2.5. Distal margin of S8 lacking medial process or sclerotised area. Ventromedial area of hypandrium not markedly constricted. Gonostylus clearly attenuate (viewed ventrally). Aedeagal terminal filaments well developed and filamentous. Gonostylus longer than gonocoxite (viewed ventrally). Aedeagus strongly curved, greatly elongate and tubular. Epandrium simple (without obvious lobes or projections).

Material examined: **Holotype**: NAMIBIA: 1♂, 'Ghaub 47 / Tsumeb / SE 1917 Bc/d / 19–28 Nov. 1972', 'H10712'; (NMNW).

Type locality: Namibia, Tsumeb, Ghaub 47 [farm].

Comments: Known only from a poorly preserved specimen collected at some distance from any other known *Valiraptor* specimen (Fig. 255). The genitalia, which are only weakly sclerotised, clearly show the same basic structure characteristic of the genus. More material is required, and the female is unknown.

Valiraptor silvestris sp. n. (Figs 236–243)

Etymology: L. *silvestris* – of woods, referring to the fact that the species is found in association with forests.

Diagnosis: *Head*: Antennal scape and pedicel blackish, pedicel with at most a narrow yellowish apex; postpedicel longer than stylus. Face gold pruinose; mystax with yellow macrosetae above epistomal margin. *Thorax*: Postpronotal lobe with long setae.

Dorsocentrals present both anterior and posterior to transverse suture. Microtrichia cover almost entire wing. Prothoracic femur with long, fine, hair-like posteroventral setae. Metathoracic coxa with one lateral macroseta; trochanter brownish yellow; femur anteriorly yellow with brown-black markings with black and yellow/white macrosetae. *Abdomen*: Ovipositor relatively long and narrow (length:width ratio, measured dorsally >3.3) and relatively long and shallow (length:depth ratio, measured laterally >2.8). Gonocoxite length:width ratio >2.5. Distal margin of S8 with poorly developed medial process. Ventromedial area of hypandrium not markedly constricted. Gonostylus clearly attenuate (viewed ventrally). Aedeagal terminal filaments well developed and filamentous. Gonostylus longer than gonocoxite (viewed ventrally). Aedeagus strongly curved, greatly elongate and tubular. Epandrium simple (without obvious lobes or projections).

Material examined: **Holotype**: SOUTH AFRICA: 1♂, 'South Africa / Natal / Karkloof Falls [29°24'S:30°16'E] / 15.i.1978 / JGH Londt'. **Paratypes**: SOUTH AFRICA: 10♂ 9♀, same data as holotype; 1♂, 'South Africa: Natal / Pietermaritzburg / 2930Cb 24.xi.1977 / JGH Londt / Town Bush'; 3♂ 1♀, 'South Africa: Natal / Pietermaritzburg / 2930Cb 25.ii.1981 / JGH Londt / Town Bush'; 1♂, 'South Africa: Natal / Pietermaritzburg / 2930Cb 10.iii.1983 / JGH Londt / Town Bush'; 2♂ 1♀, 'South Africa: Natal / Pietermaritzburg / 2930Cb 27 March 1980 / JGH Londt / Town Bush'; 2♂ 2♀, 'South Africa: Natal / Pietermaritzburg / 2930Cb 20.xii.1978 / JGH Londt / Town Bush'; 2♂, 'South Africa: Natal / Pietermaritzburg / Ferncliffe Nature Res. / 29°33'S:30°20'E / Date: 9.i.1990 / Coll: J. G. H. Londt'; 1♂, 'South Africa: Natal / Pietermaritzburg / 2930Cb 10.xii.1978 / JGH Londt Montrose'.

Other material examined (no type status): SOUTH AFRICA: 1♂, 5 km W. Sabie, 2530BB, Lone Creek River, xii 5, 1976, Miller; 1♂ 1♀, Mt Emlembe near Havelock Mine on Barberton Road, 25°55'S:31°07'E 2531CC, 7.xi.1970, Stuckenberg 1425 m, Montane forest & streams; 1♀, 17 km N. Utrecht, Elandsnek Farm, 27°27·27'S:30°25·24'E, 1700–1900 m, 1.xii.1999, Dikow, Rocky grassland; 1♀, Kube Yini Game Res, 27°48'S:32°14'E, 360 m, 10–14.i.1994, Natal Musm Expedition; 1♀, Harrismith, 2829AC, 17–18.xii.1981, Schoeman; 3♀, Van Reenen Pass, 2829AD, 1.ii.1981, Stuckenberg; 1♂, Nkandla Forest [28°43'S:31°08'E], 22.x.1982, Reavell, *Aristida junceifor.* Grassland; 1♂, Balgowan Area, 29°21'S:30°05'E, 1320 m, 28.x.1993, Londt, 50 km N.W. PMB (on N3); 1♂, 1·5 km N.W. Lidgetton, 2930Ac, 8.xii.1979, Miller & Stabbins, ca. Caversham Falls; 1♀, 15 km N.E. Howick, Karkloof Falls, 2930Ac, 1500 m, 14.ii.1979, Miller; 1♂, Albert Falls Nat Res, 2930Ad, 14.iii.1981, Miller, along river; 1♀, Hilton [29°30'S:30°19'E], 26.i.1985, Seymour; 1♀, Umgeni Res [Reserve – 29°28'S:30°16'E], nr Howick, 10.i.1985, Recently burned grassveld; 1♂, Doreen Clarke Nat. Res., 29°34'40"S:30°17'20"E, 1100 m, 7.iii.1988, Londt, Mistbelt Mixed Forest; 3♂ 1♀, Pietermaritzburg, Townbush Valley, xii.1976, Miller, Malaise; 1♂, Town Bush, Pietermaritzburg, 27.xi.1961, B. & P. Stuckenberg; 1♀, Pietermaritzburg, 2930Cb, 14.xii.1978, Londt, Town Bush; 1♂, Town Bush Forest Res, 2930CB, 7.i.1983, Barraclough; 9♂ 4♀, Town Bush Forest Res, 2930CB, 1–.ii.1983, Barraclough; 1♀, Pietermaritzburg, 2930CB, 30.iii.1982, Barraclough, Town Bush Forest Res.; 1♂, Ferncliffe Nature Res., nr. Pietermaritzburg, 29°33'S:30°20'E, 9.i.1990, Whittington, Indig. For.; 1♀, Pietermaritzburg, Ferncliffe, 26.iv.1990, Brothers; 1♂, Pietermaritzburg, 29°33'S:30°21'E, 900 m, Ferncliffe Nature Res., 12.iii.1992, Robertson, Bracken valley; 1♀, Pietermaritzburg, Ferncliffe Nature Res., 29°33'S:30°21'E, 900 m, 12.iii.1992, Barraclough, Bracken valley; 2♀, Pietermaritzburg, Ferncliffe Nature Res., 29°33'S:30°21'E, 900 m, 12.iii.1992, Whittington, Bracken valley; 1♂, Pietermaritzburg, 2930Cb, 27.xii.1978, Londt, QE Park; 1♂ 2♀, Pietermaritzburg, Queen Elizabeth Park, 29°34'S:30°19'E, 3020' Alt., 8.iii.1990, Bourquin; 1♂, 'P.M.Burg [Pietermaritzburg], 5.i.1911, Fuller; 1♂ 1♀, Krantzkloof Nat. Res., 29 46'S:30 50'E, 400 m, 18.xii.1990, Whittington, Indigenous Forest; 1♀, Krantzkloof Nature Res., 29°45'13"S 30°51'07E, 300 m, 1.ii.2000, Londt, Grassland/Stream edge; 1♀, Kloof, 1915, Marley; 2♀, 10 km S.E. Ahrens, Lilani Rd, 2930BD, 8.iv.1986, Londt, Grassveld & Forest margins; 1♂ 1♀, Mhlatuzana River, 29 48'S:30 45'E, 500 m, 18.xii.1990, Whittington, Indig. Forest, Jackson's Falls; 1♂, St. Helier, Clifton Canyon, nr. Hilcrest, 2930DD, 3.xii.1978, Miller, in "Gillits" forest; 5♂ 1♀, Gillitts, Pinetown district, 20.xii.1961, [4♂ 1♀] 21.xi.63 [1♂], B & P Stuckenberg; 2♂, Gillitts, 17.xi.1976, Londt, Indigenous Forest; 5♂ 3♀, Gillitts, St. Helier, 7.xii.1978, Londt; 4♂ 3♀, Oribi Gorge Reserve [30°42'S:30°17'E], Umzimkulwana Valley, 21–28.xi.1960, B. & P. Stuckenberg.

Type locality: South Africa, KwaZulu-Natal, Karkloof Falls.

Comments: Although I have seen quite a number of specimens, these come from relatively few localities (Fig. 255) located in two South Africa provinces (KwaZulu-Natal and Mpumalanga). The species may be locally abundant, usually found along forest margins (i.e. the forest/grassland ecotone).

Valiraptor vittatus sp. n. (Figs 244–248)

Etymology: L. *vitta* – band or stripe, refers to the blackish longitudinal medial stripe of the mesonotum.

Diagnosis: *Head*: Antennal scape and pedicel yellowish; postpedicel longer than stylus. *Thorax*: Postpronotal lobe with long setae. Dorsocentrals posterior to transverse suture only. Microtrichial coverage of wing moderate in distal area (proximal tip of cell r_5 bare). Prothoracic femur with long, fine, hair-like posteroventral setae. Katatergal macrosetae mostly dark red-brown. Metathoracic coxa with one lateral macroseta; trochanter brownish yellow; femur anteriorly entirely yellowish or light brownish with dark red-brown to black macrosetae. *Abdomen*: Gonocoxite length:width ratio >2.5. Distal margin of S8 lacking medial process or sclerotised area. Ventromedial area of hypandrium not markedly constricted. Gonostylus moderately slender (viewed ventrally). Aedeagal terminal filaments well developed and filamentous. Gonostylus shorter than gonocoxite (viewed ventrally). Aedeagus strongly curved, greatly elongate and tubular. Epandrium simple (without obvious lobes or projections).

Material examined: **Holotype**: SOUTH AFRICA: 1♂, 'RSA Mpumalanga #91 / 16km North of Sabie / 25°[incorrect – 24°]58'S:30°49'E 1350m / Date: 11.xii.1997 / Coll. JGH & A Londt / Forest Falls Trail'. **Paratypes**: SOUTH AFRICA: 1♂, 'S Africa: E Transvaal / 11km W Sabi [Sabie] 2530BB / Lone Creek River / xii.5.1976 R Miller'; 1♂, 'S Africa: N Transvaal / Entabeni For. Station / Zoutpansberg Range / Jan. 1975 Stuckenberg / indigenous for. 2230CC'.

Type locality: South Africa, Mpumalanga, 16 km North of Sabie, Forest Falls Trail area.

Comments: A species readily separated from its congeners using the mesonotal stripe. It inhabits forested environments in the Limpopo and Mpumalanga provinces of South Africa (Fig. 254).

DISCUSSION

Taxonomy

In an alpha-taxonomic study of this kind, there is often debate on what constitutes a genus. Tsacas (1969) in discussing afrotropical *Neomochtherus* species, observed that a number of species groups could be recognised. He took a conservative approach in deciding not to formalise such groups by giving them generic or even subgeneric status. Lehr (1996), on the other hand, chose to give Tsacas' species groups generic status. My study confirms that there do indeed appear to be groups of species within this fauna, and so *Neomochtherus sensu* Tsacas (1969) must be seen as polyphyletic. To draw attention to this I have followed Lehr in according generic status to each identifiable group. It is, however, clear that many of the genera considered here are quite closely related and therefore difficult to define. Although Lehr (1996) emphasised characters of the male genitalia, he could not confidently delimit each of his taxa in terms of genital characteristics and no key was provided. While I have confirmed that species within the genera recognised in this paper do appear to have similarly developed genitalia, I too have had difficulty defining the groups on the basis of genital morphology. This is due to a number of limitations. For example, it is difficult to establish the degree of individual or geographic variation as large numbers of specimens would have to be dissected, and this would be unacceptably time-consuming. In addition, dissected material is difficult to interpret, as detailed morphological studies of the often tiny structures involved have yet to be undertaken. Not withstanding these considerations, I believe that my study has consolidated our understanding of the afrotropical Asilinae.

The status of some genera in the afrotropical asiline fauna needs further attention. The most pressing need is to establish the limits of *Machimus* in the light of the existence in the Natal Museum collection of a number of undescribed species which do not appear to conform to the currently accepted concept of this genus. Another useful project would be to establish the validity of *Cerdistus* in the afrotropical fauna. As this is primarily a palaearctic genus, the project would probably have to be part of a major work covering all known species, something one of my European colleagues might care to undertake.

Phenology, distribution and biology

Although little is known about the species reviewed and described in this paper, some general observations can be recorded. The phenology and broad distribution of the taxa are summarised in Tables 5 and 6 respectively.

Afromochtherus: While data are limited for a few of the species, the adults appear to be mid-summer fliers – being recorded from September through to April, with a single capture reported in June (Table 5). Most of the species (9) are recorded from southern Africa, while the others (4) are Central and East African (Table 6). Personal experience suggests that species are ground inhabiting, or

Table 5

The phenology of asiline species studied in this paper. Abbreviations refer to months of the year.

Species	**J**	**A**	**S**	**O**	**N**	**D**	**J**	**F**	**M**	**A**	**M**	**J**
Afromochtherus												
anatolicus	-	-	-	-	●	●	-	-	-	-	-	-
astiptus	-	-	-	-	-	-	-	-	●	-	-	-
atrox	-	-	-	-	-	-	-	-	-	-	-	-
kolodrilus	-	-	-	-	-	●	-	-	-	-	-	-
malawi	-	-	-	-	-	●	-	-	-	-	-	-
megastylus	-	-	-	-	-	-	-	-	-	●	-	-
melanurus	-	-	-	-	●	-	●	-	●	-	-	-
mendax	-	-	-	●	●	●	●	●	●	-	-	●
mkomazi	-	-	●	●	●	-	●	-	-	-	-	-
peri	-	-	●	●	●	●	●	-	-	●	-	-
sathus	-	-	-	●	-	-	-	-	-	-	-	-
unctus	-	-	-	●	●	●	-	-	-	-	-	-
zoropegus	-	-	-	-	●	●	●	-	-	-	-	-
Aneomochtherus												
africanus	-	-	-	-	-	-	●	●	-	●	●	-
deserticolus	-	-	-	-	-	-	-	-	-	-	-	-
monobia	-	-	-	-	●	●	●	●	●	●	-	-
Caenoura												
annulitarsis	-	-	-	-	●	●	●	●	●	●	●	-
sinuatus	-	-	-	-	-	●	●	●	●	●	-	-
Dikowmyia												
mediorus	-	-	-	-	-	-	-	-	●	-	-	-
Gongromyia												
bulla	-	-	-	-	-	●	-	-	-	-	-	-
Melouromyia												
diaphorus	-	-	-	-	-	-	●	-	-	-	-	-
natalensis	-	-	●	-	-	●	●	●	●	●	●	●
Notomochtherus												
brevicauda		-	-	-	-	-	●	-	-	-	-	-
Sphagomyia												
botswana	-	-	-	●	●	●	-	-	-	-	-	-
kenya	-	-	-	●	-	-	-	-	-	-	-	-
Tsacasiella												
blanda	-	●	-	-	-	-	-	-	-	●	-	-
debilis	●	-	-	-	-	-	-	-	-	●	-	-
exilis	-	-	-	-	-	-	-	-	-	-	-	●
futilis	-	●	-	-	●	-	-	-	-	-	●	●
inornata	-	-	-	-	-	-	●	●	●	●	●	-
instabilis	-	-	-	-	-	-	-	●	-	●	-	-
kivuensis	-	●	-	-	-	-	-	-	-	-	-	-
neavei	-	-	-	-	-	-	-	-	-	●	●	-
Valiraptor												
montanus	-	-	-	-	-	●	●	●	●	●	-	-
namibiensis	-	-	-	-	●	-	-	-	-	-	-	-
silvestris	-	-	-	●	●	●	●	●	●	●	-	-
vittatus	-	-	-	-	-	●	●	-	-	-	-	-
Species	**1**	**3**	**3**	**8**	**13**	**16**	**16**	**10**	**11**	**14**	**6**	**4**

Table 6

The distribution of asiline species studied in this paper. Abbreviations: Bo = Botswana; DC = Democratic Republic of the Congo; Ke = Kenya; Le = Lesotho; Ma = Malawi; Mo = Mozambique; Na = Namibia; Ru = Ruanda; SA = Republic of South Africa; Sw = Swaziland; Ta = Tanzania; Za = Zambia; Zi = Zimbabwe.

Species	**SA**	**Le**	**Sw**	**Na**	**Bo**	**Zi**	**Za**	**Mo**	**Ma**	**DC**	**Ru**	**Ta**	**Ke**
Afromochtherus													
anatolicus	●	-	-	-	-	-	-	-	-	-	-	-	-
astiptus	-	-	-	●	-	-	-	-	-	-	-	-	-
atrox	-	-	-	-	-	-	-	-	-	●	-	-	-
kolodrilus	●	-	-	-	-	-	-	-	-	-	-	-	-
malawi	-	-	-	-	-	-	-	-	●	-	-	-	-
megastylus	-	-	-	●	-	-	-	-	-	-	-	-	-
melanurus	●	-	-	-	-	-	-	-	-	-	-	-	-
mendax	●	-	-	●	-	●	-	-	-	-	-	-	-
mkomazi	-	-	-	-	-	-	-	-	-	-	-	●	-
peri	●	-	-	-	●	●	-	-	-	-	-	-	-
sathus	-	-	-	-	-	●	●	-	-	-	-	-	-
unctus	-	-	-	-	-	-	-	-	●	-	-	●	●
zoropegus	●	-	-	-	-	-	-	-	-	-	-	-	-
Aneomochtherus													
africanus	-	-	-	-	-	-	-	-	-	-	-	●	●
deserticolus	-	-	-	-	-	-	-	-	-	-	-	●	-
monobia	-	-	-	-	-	-	-	-	-	-	-	●	-
Caenoura													
annulitarsis	●	●	-	-	-	●	-	-	-	-	-	-	-
sinuatus	●	-	-	-	-	●	-	-	-	-	-	-	-
Dikowmyia													
mediorus	●	-	-	-	-	-	-	-	-	-	-	-	-
Gongromyia													
bulla	●	-	-	-	-	-	-	-	-	-	-	-	-
Melouromyia													
diaphorus	●	-	-	-	-	-	-	-	-	-	-	-	-
natalensis	●	-	●	-	●	●	-	●	●	-	-	-	-
Notomochtherus													
brevicauda	●	-	-	-	-	-	-	-	-	-	-	-	-
Sphagomyia													
botswana	●	-	-	-	●	-	-	-	-	-	-	-	-
kenya	-	-	-	-	-	-	-	-	-	-	-	-	●
Tsacasiella													
blanda	-	-	-	-	-	-	-	-	-	●	●	-	-
debilis	-	-	-	-	-	-	-	-	-	●	-	-	-
exilis	-	-	-	-	-	-	-	-	-	●	-	-	-
futilis	-	-	-	-	-	-	●?	-	-	●	-	-	●
inornata	-	-	-	●	●	●	-	-	●	-	-	-	-
instabilis	-	-	-	-	-	-	-	-	●	●	-	-	-
kivuensis	-	-	-	-	-	-	-	-	-	●	-	-	-
neavei	-	-	-	-	-	-	●	-	-	-	-	-	-
Valiraptor													
montanus	●	-	-	-	-	-	-	-	-	-	-	-	-
namibiensis	-	-	-	●	-	-	-	-	-	-	-	-	-
silvestris	●	-	-	-	-	-	-	-	-	-	-	-	-
vittatus	●	-	-	-	-	-	-	-	-	-	-	-	-
Species	**17**	**1**	**1**	**5**	**4**	**7**	**3**	**1**	**5**	**7**	**1**	**5**	**4**

rest on stones (i.e. habitat categories 1a, 1c & 2b of Londt (1994)). The ovipositor is relatively short and broad when compared with related genera, and is probably adapted for depositing eggs directly into sand or soil. Four prey records are available, all for males of *A. mendax* – two hemiptera (Alydidae & ?Cicadelidae), two Diptera (Mycetophilidae & Muscidae).

Aneomochtherus: Adults are active between November and May and probably have their peak abundance in the later part of the southern hemisphere summer (bearing in mind that species live near the equator and that *africanus* straddles it) (Table 5). The known species are apparently confined to the East African countries of Tanzania and Kenya (Table 6). Little is known about the biology of this genus. Ovipositors are longish and somewhat laterally compressed, suggesting that species deposit their eggs into suitable places on plants (i.e. cracks in bark or in leaf axils). *A. monobia* apparently inhabits woodland and grassy areas, so an association with grass seems a strong possibility.

Caenoura: Adults are active between November and May, being most prevalent during the late summer months of January, February and March (Table 5). The two known species are confined to South Africa and Lesotho (Table 6). Personal experience indicates a strong association with grasslands – *C. annulitarsis* can be extremely common in open grasslands, while *C. sinuatus* is associated with the grassy margins of forest patches. The species can therefore be placed in category 4a of Londt's (1994) classification of habitats occupied by asilids. The ovipositor of *C. annulitarsis* is clearly adapted for lodging eggs in crevices in vegetation, while that of *C. sinuatus* may allow eggs to be deposited directly into soil. Seven prey records are available – 6♀ *C. annulitarsis* pinned with Lepidoptera (2 unidentified moths); three ant alates (Hymenoptera: Formicidae); two flies (Diptera: Muscidae & Lonchaeidae); 1♀ *C. sinuatus* with a fly (Diptera, Muscidae).

Dikowmyia: The few specimens were captured in March (Table 5) in South Africa (Table 6). The only known species was captured in long grass in an open situation and so may also be placed in category 4a of Londt (1994). The ovipositor is intermediate between being short and conical, and long and laterally compressed, so oviposition behaviour is difficult to predict.

Gongromyia: The few known specimens were captured in December (Table 5) in South Africa (Table 6). They may have been collected from grassland, and the ovipositor could be adapted for laying eggs into plant crevices.

Melouromyia: The majority of records indicate that adults of the two known species are active during late summer (between December and June, there being a single record from September) (Table 5). While data for *M. diaphorus* are limited, *M. natalensis* is fairly widely distributed in southern Africa (Table 6) and also occurs in the Central African country of Malawi. *M. natalensis* has been collected from woody shrubs in suburban gardens in Pietermaritzburg, so may be classified as belonging to Londt's (1994) category 5a or 5b. The ovipositor is long and laterally compressed, and therefore ideally adapted for oviposition in plants. Five prey records are available, all for *M. natalensis* females – flies (Diptera: two Muscidae, Tipulidae, Asilidae (*Dasophrys* sp.)) and a bug (Homoptera: Dictyopharidae).

Notomochtherus: The few known specimens were captured in January (Table 5) in South Africa (Table 6). The only species known appears to be most closely related to *Afromochtherus* species. The ovipositor is of a similar design, and so the species may also inhabit open sandy areas and deposit eggs beneath the soil surface.

Sphagomyia: Although the two known species are apparently separated geographically by some distance, all known specimens were collected during October, November and December (i.e. early summer) (Table 5). *P. botswana* is found in the northern parts of southern Africa, while *P. kenya* is East African (Table 6). Most of the material from Botswana was collected in Malaise traps set in open woodland. Like *Dikowmyia*, the ovipositor is somewhat intermediate in development, but is probably used to deposit eggs into plant crevices.

Tsacasiella: Although data are limited, species appear to be late summer fliers – five of the eight species having been collected in April (Table 5). Apart from *T. inornata*, which has a distribution centred on southern Africa (but is also recorded from Malawi), all the species are Central African with one (*T. futilis*) also being recorded from East Africa (Table 6). Ovipositors are long and somewhat laterally compressed, and therefore probably adapted for laying eggs into plant crevices. The rather unusual, curved form of the ovipositor of *T. futilis* may be an adaptation for highly specialised oviposition behaviour.

Valiraptor: Species are active between October and April, thus having a mid to late summer flight period (Table 5). The species are confined to southern Africa, there being only one record from outside South Africa (Table 6). *V. silvestris* inhabits rank vegetation (including grass) adjacent to forests, while *V. montanus* is associated with montane grasslands. The ovipositors, being long and laterally compressed, are adapted for laying eggs in plant crevices. These species probably belong to Londt's (1994) habitat categories 4 and 5. *V. vittatus* has been collected on low vegetation under a forest canopy. Eight prey records are available – *V. silvestris* 4♂ 3♀ pinned with flies (Diptera: Stratiomyidae, Calliphoridae, two Muscidae); two moths (Lepidoptera: unidentified) and a beetle (Coleoptera: Scarabaeidae); and *V. montanus* 1♀ pinned with an alate ant (Hymenoptera: Formicidae).

Seventeen (46 %) of the 37 species dealt with in this paper are known to occur in South Africa. If the Central African genus *Tsacasiella* is excluded, South Africa would host 59 % of the species under review. This is a notable increase in species abundance considering that Tsacas (1969) reported a small number of specimens from South Africa, representing only four species.

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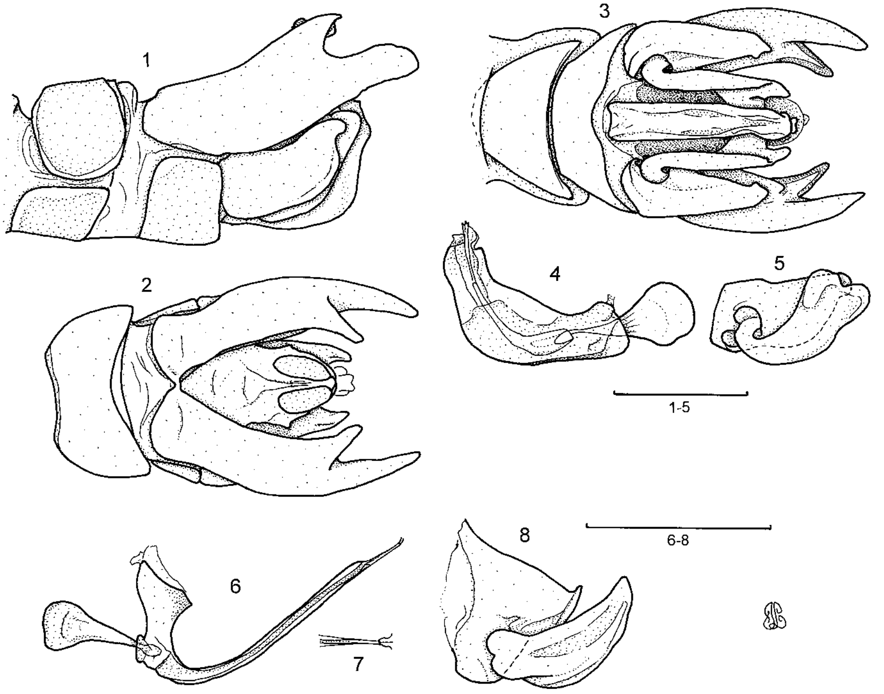
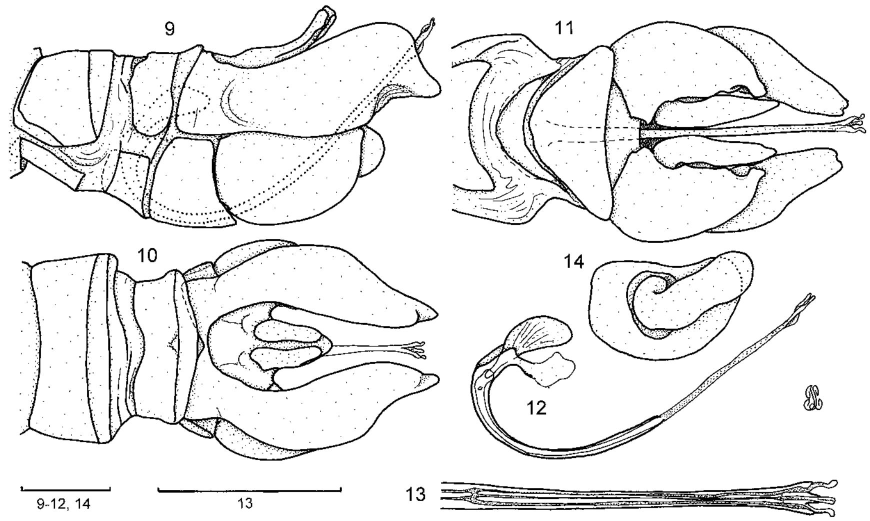
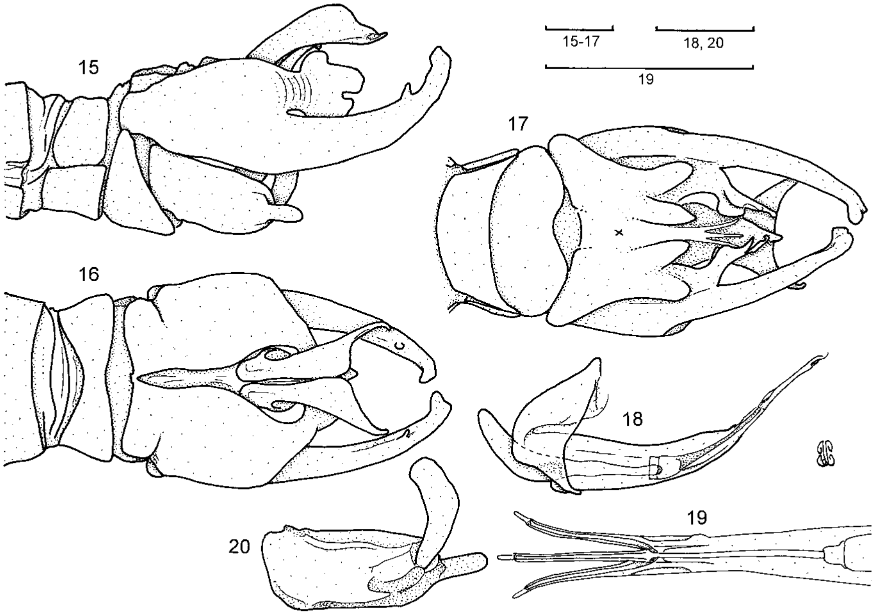


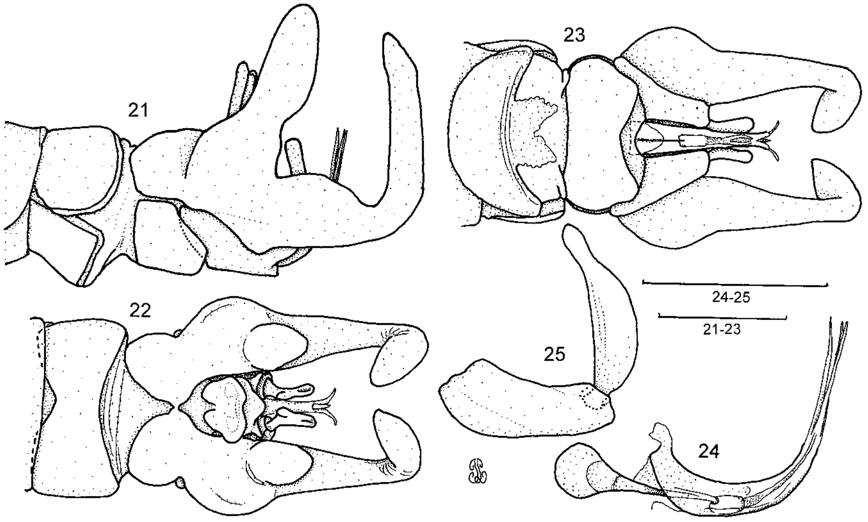
Figs 1–8. *Heligmonevra* and *Astochia* male genitalia. 1–5. *Heligmonevra fanovanensis* (Bromley, 1942) (formerly *Cobalomyia*). 1. Lateral. 2. Dorsal. 3. Ventral. 4. Aedeagus, lateral. 5. Gonocoxite and gonostylus (inside view of right side). 6–8. *Astochia armata* (Becker, 1909). 6. Aedeagus, lateral. 7. Aedeagus tip, dorsal. 8. Gonocoxite and gonostylus (inside view of right side). Scale lines = 1 mm.



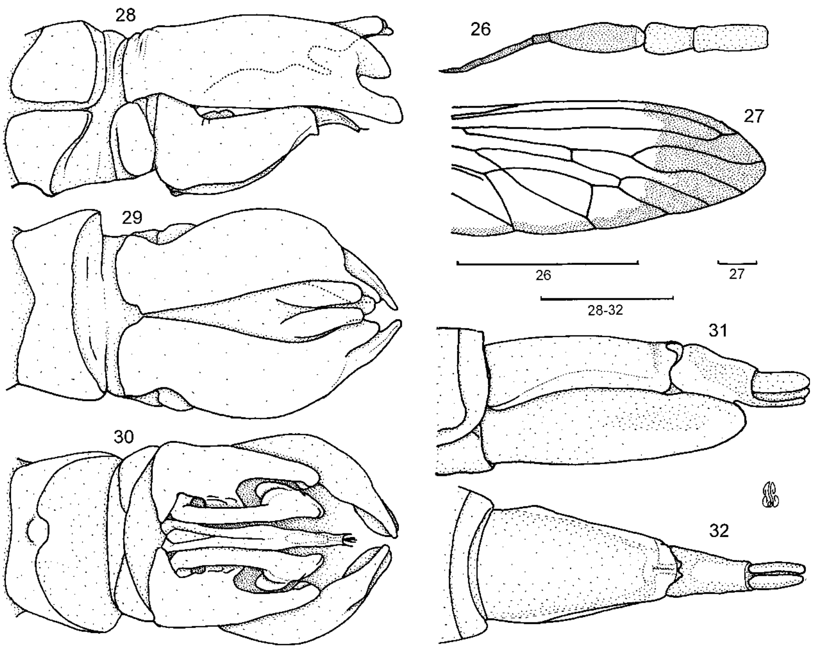
Figs 9–14. *Machimus bicolor* (Hull, 1962) (formerly *Dinozabrus*) male genitalia. 9. Lateral. 10. Dorsal. 11. Ventral. 12–13. Aedeagus. 12. Lateral. 13. Enlargement of distal end (dorsal). 14. Gonocoxite and gonostylus (inside view of right side). Scale lines = 1 mm.



Figs 15–20. *Hoplopheromerus podagricus* (Bezzi, 1914) male genitalia. 15. Lateral. 16. Dorsal. 17. Ventral (central area marked x is obscured by setae and shows no detail of structures). 18–19. Aedeagus. 18. Lateral. 19. Enlargement of distal end (dorsal). 20. Gonocoxite and gonostylus (inside view of right side). Scale lines = 1 mm.



Figs 21–25. *Heligmonevra laevis* Engel, 1927 male genitalia. 21. Lateral. 22. Dorsal. 23. Ventral. 24. Aedeagus, lateral. 25. Gonocoxite and gonostylus (outside view of left side). Scale lines = 1 mm.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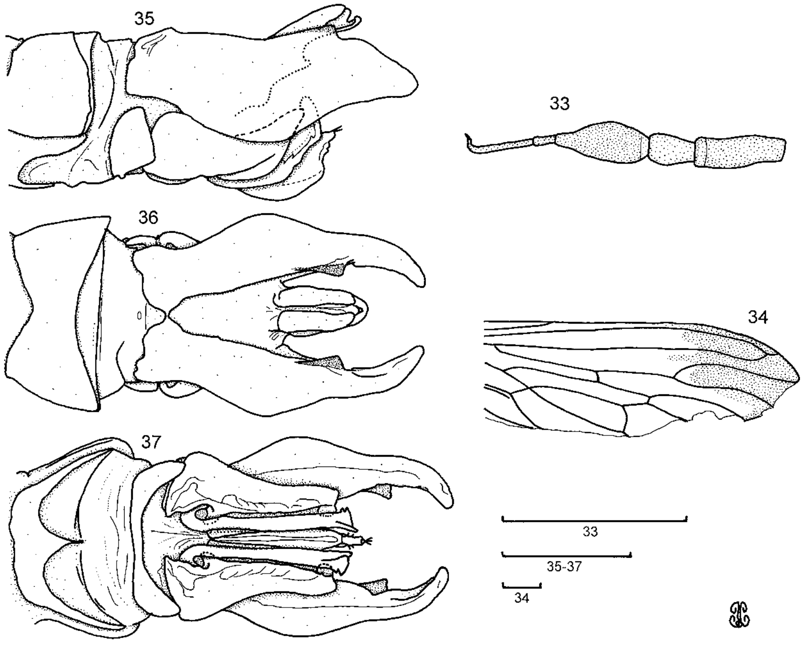
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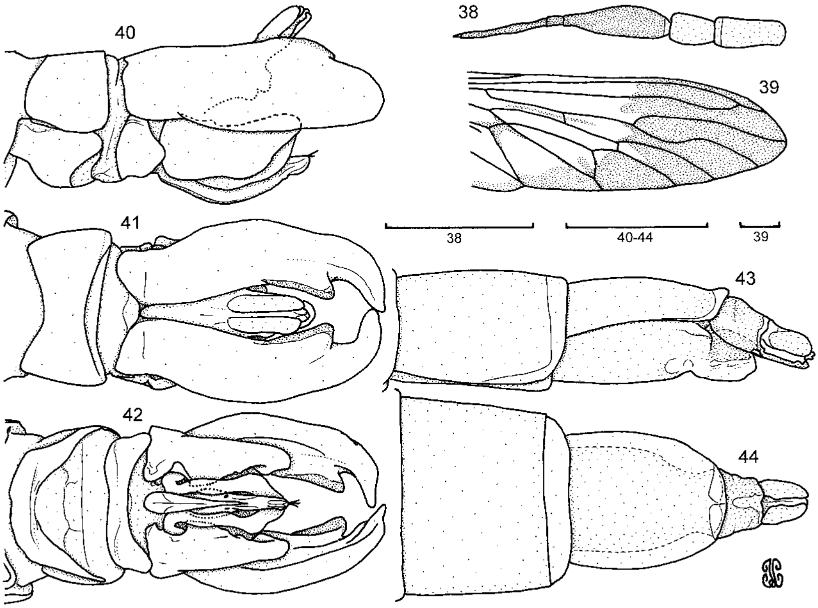
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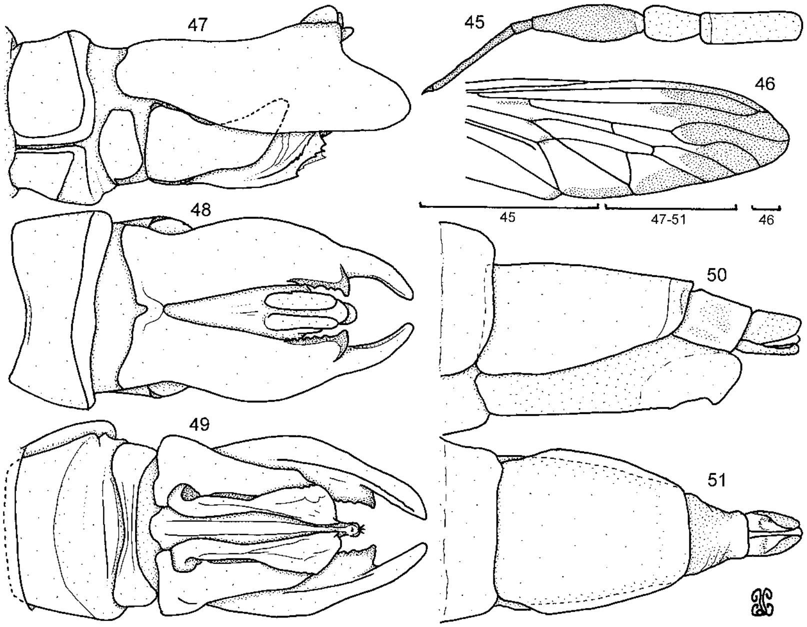
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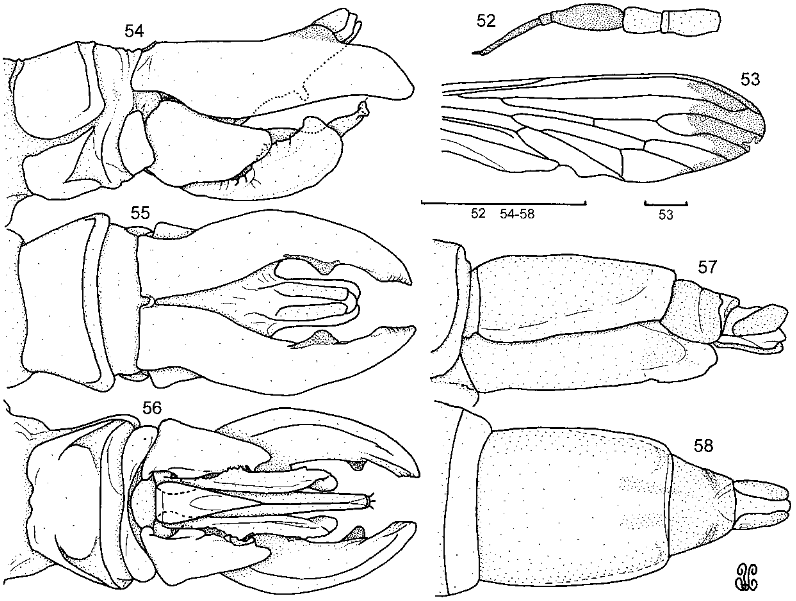
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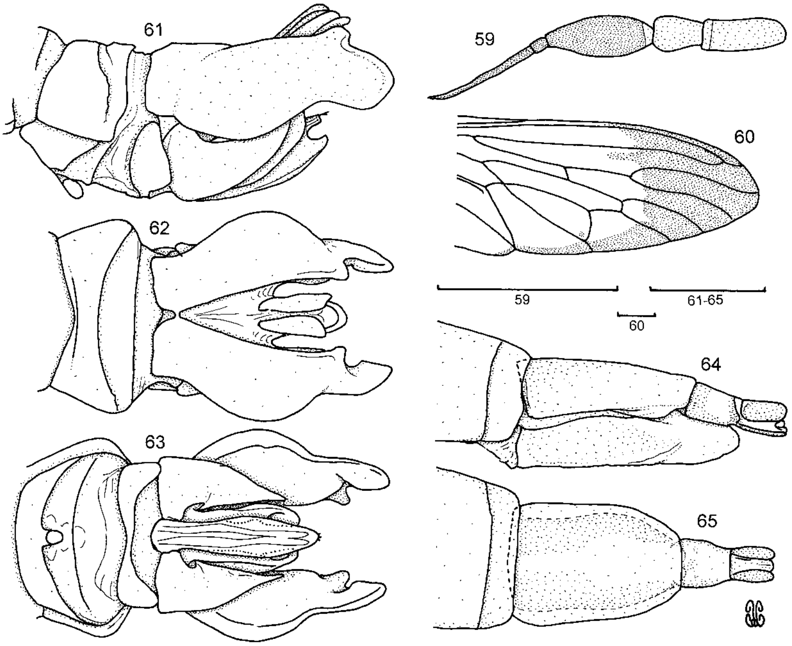
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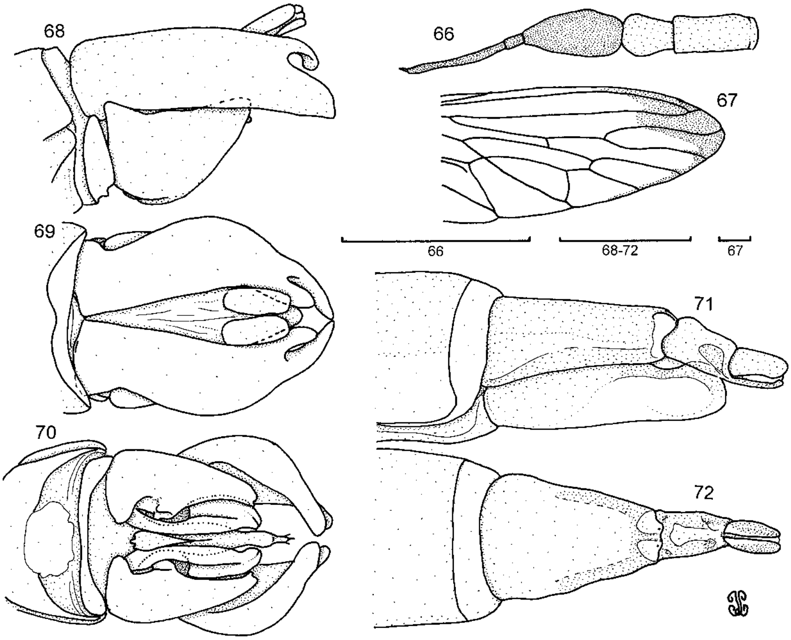
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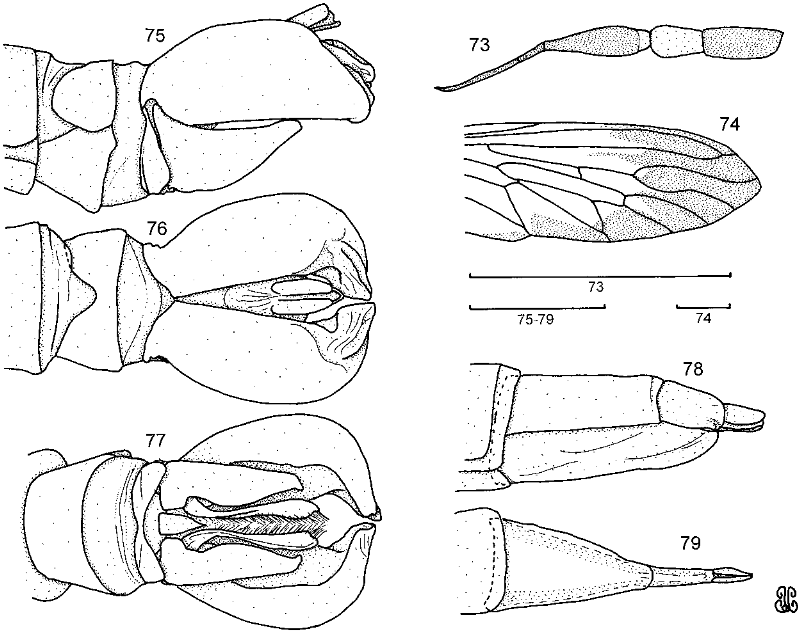
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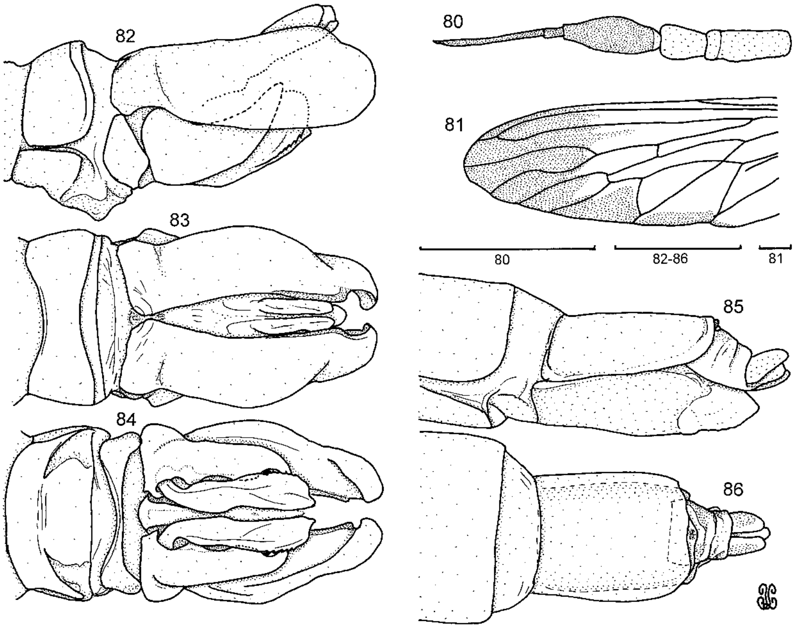
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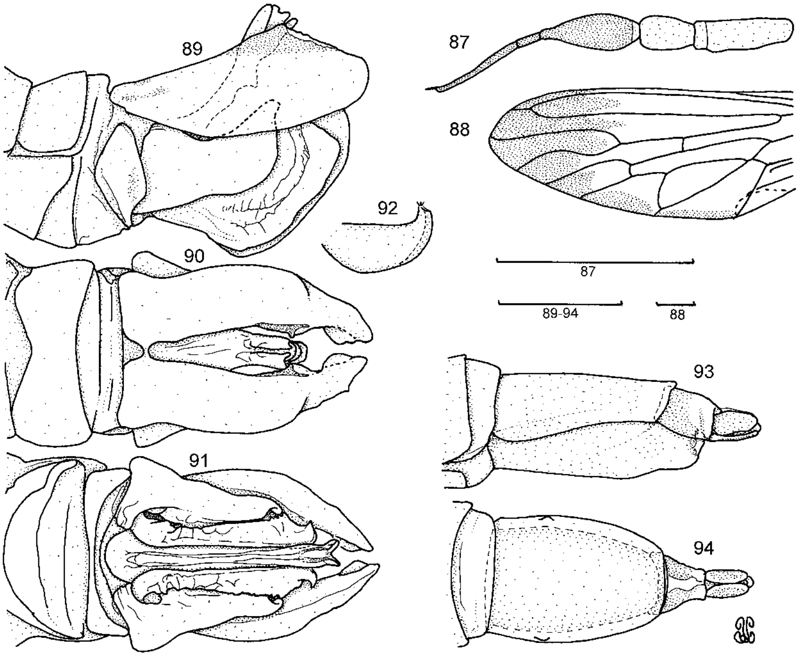
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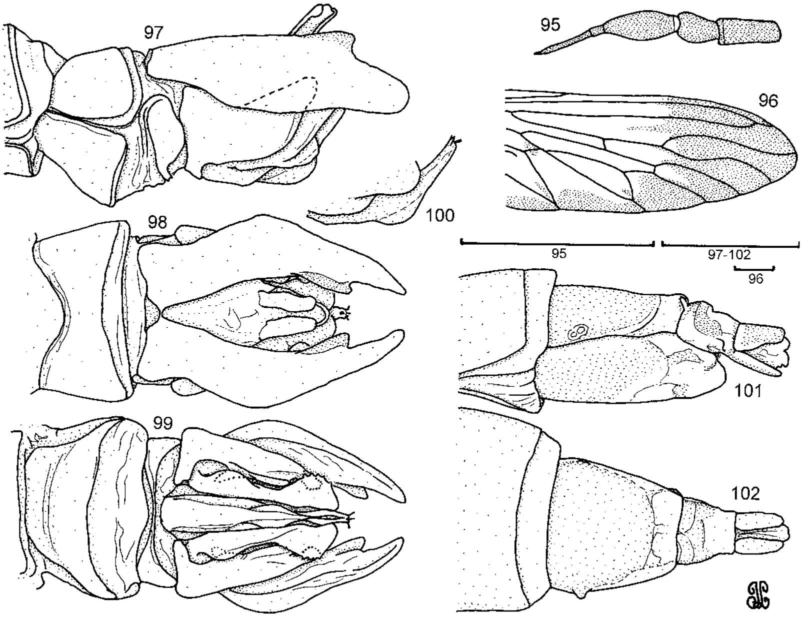
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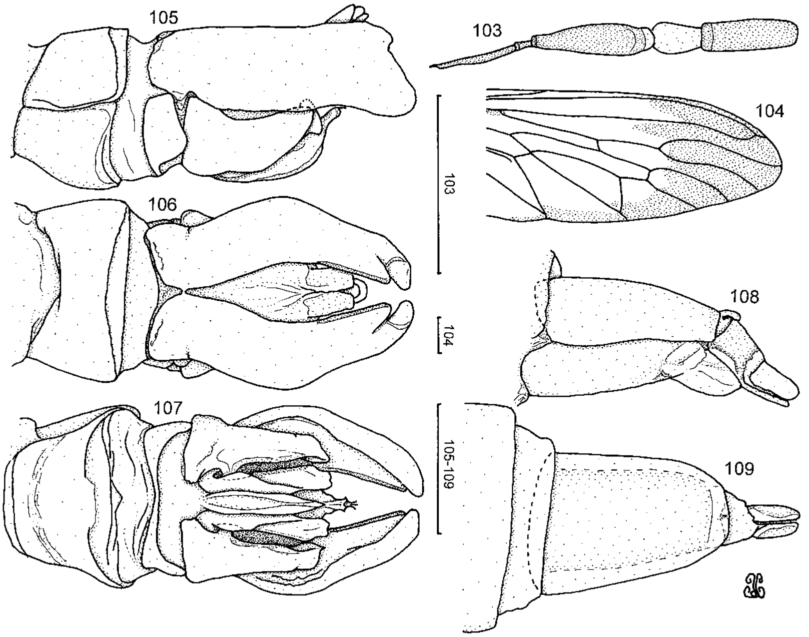
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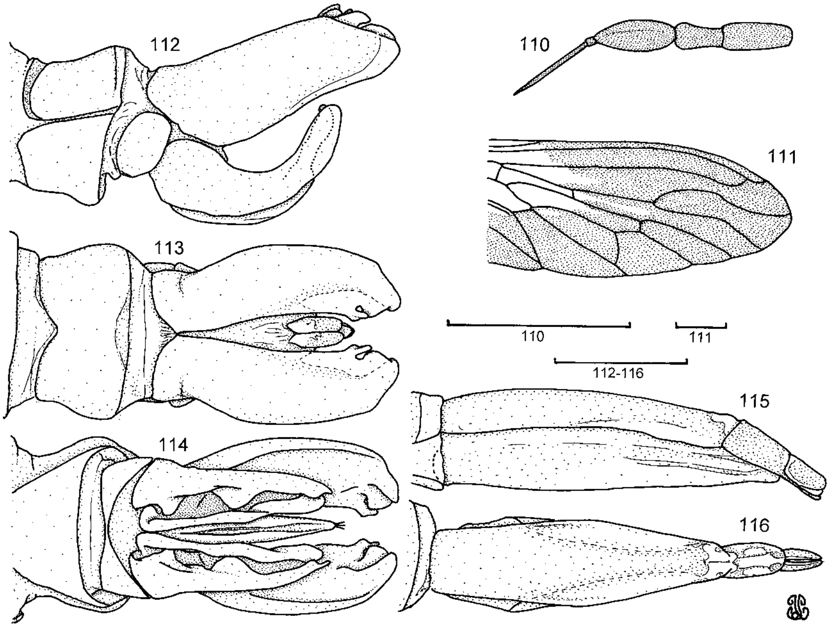
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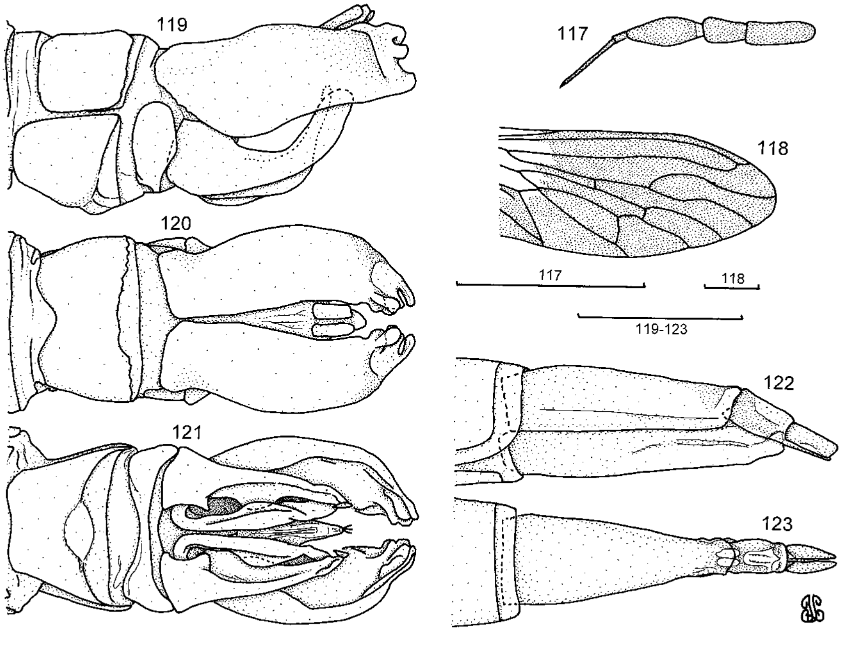
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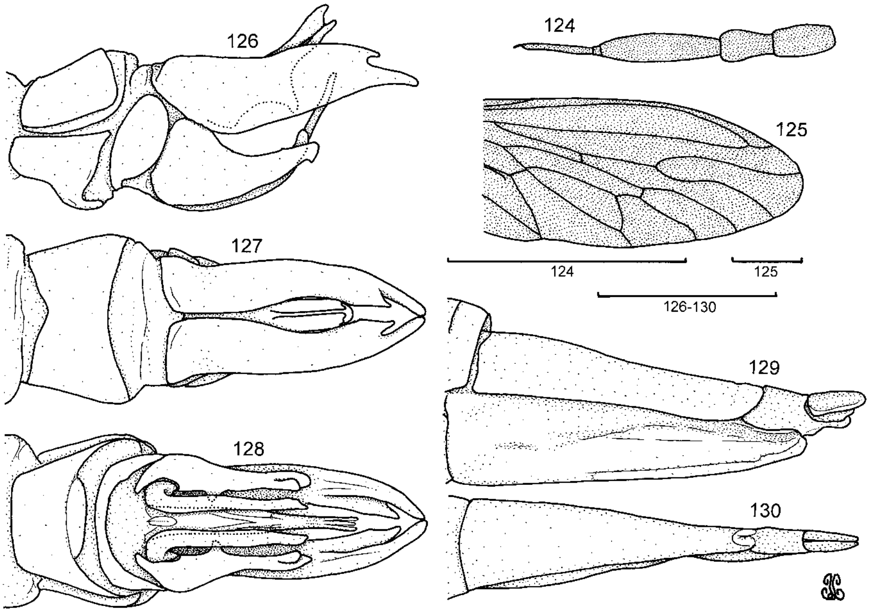
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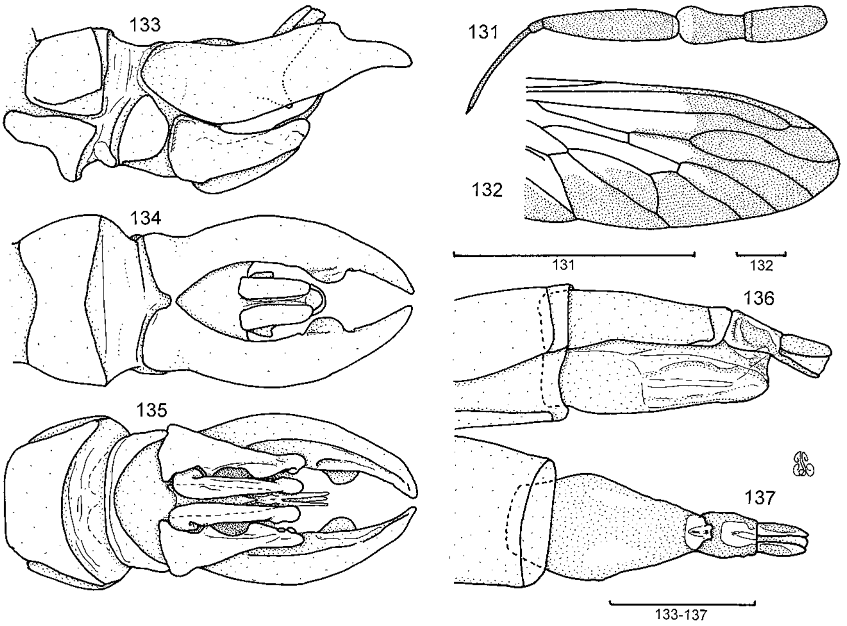
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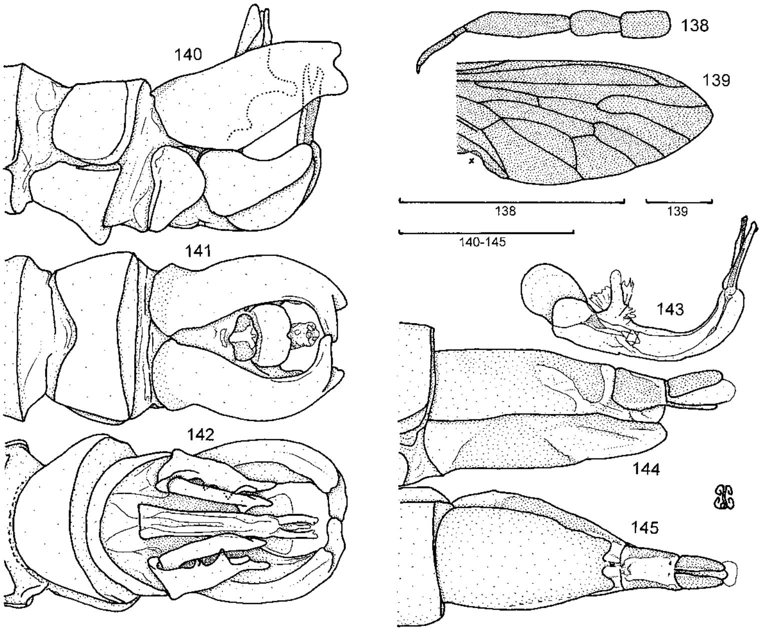
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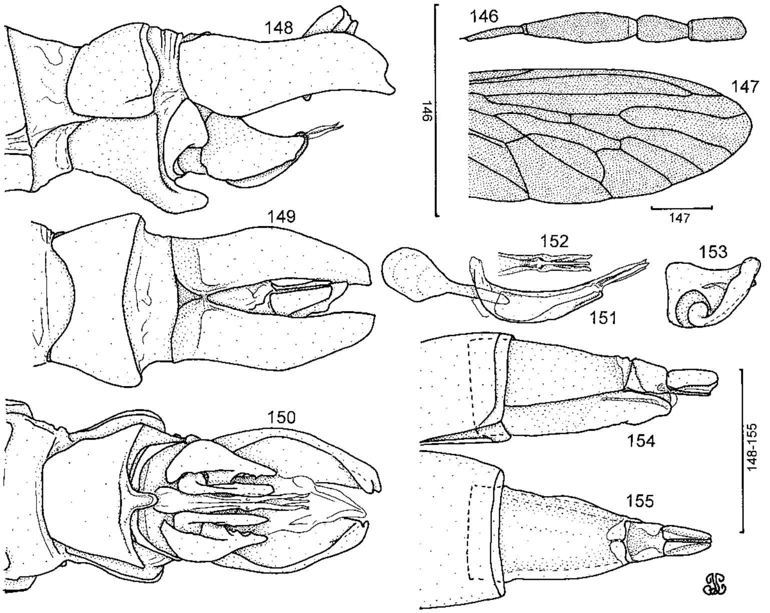
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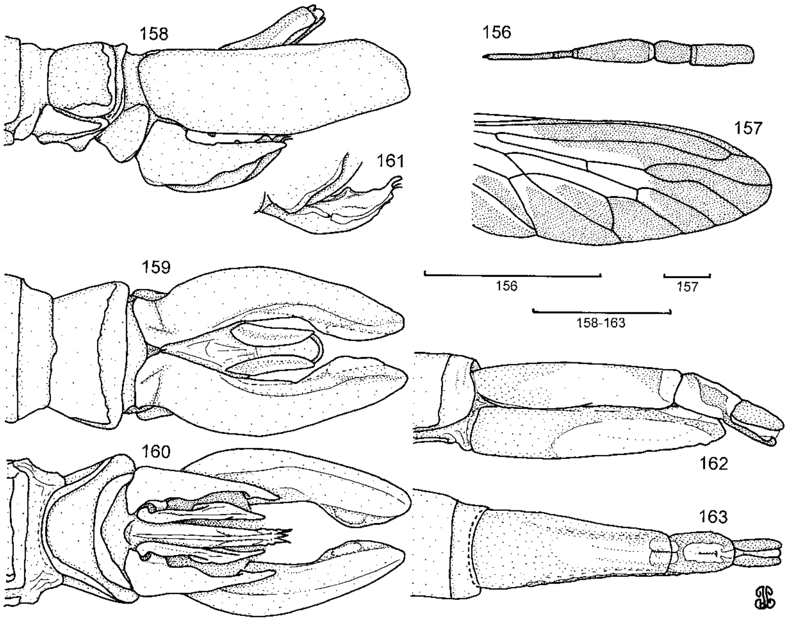
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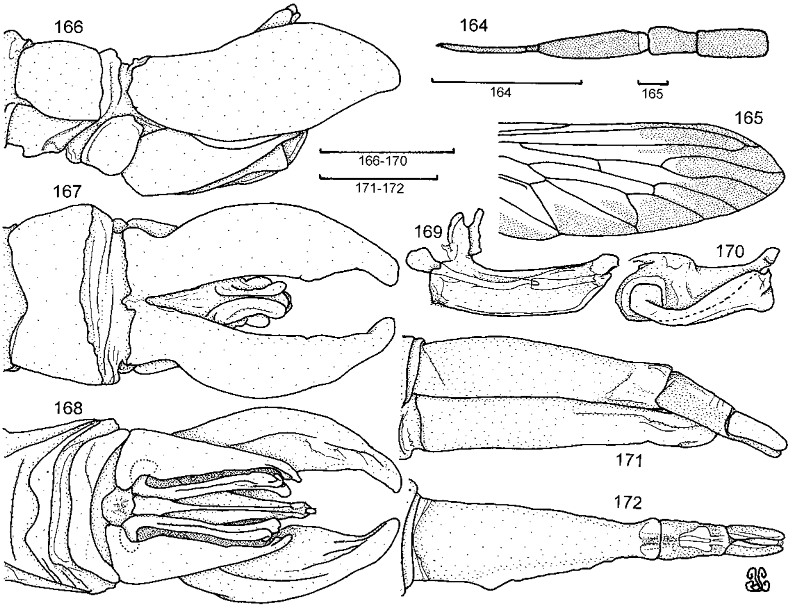
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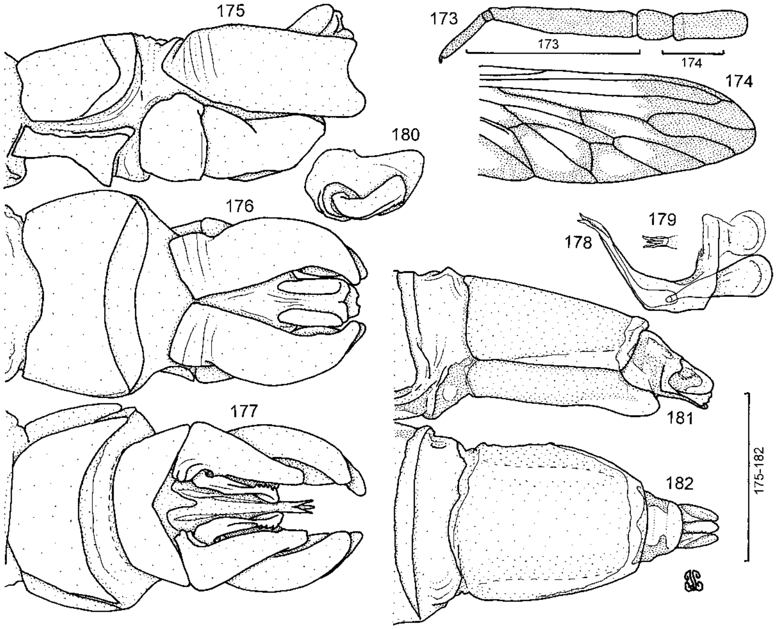
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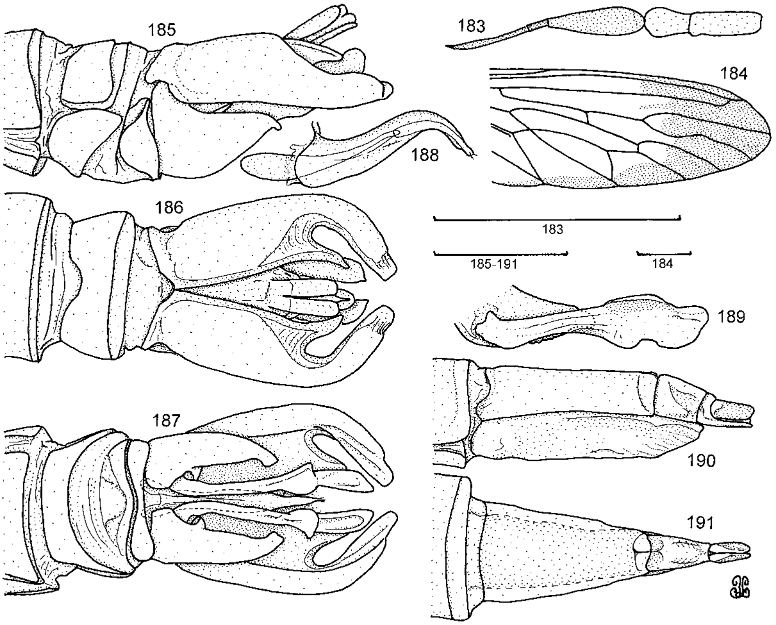
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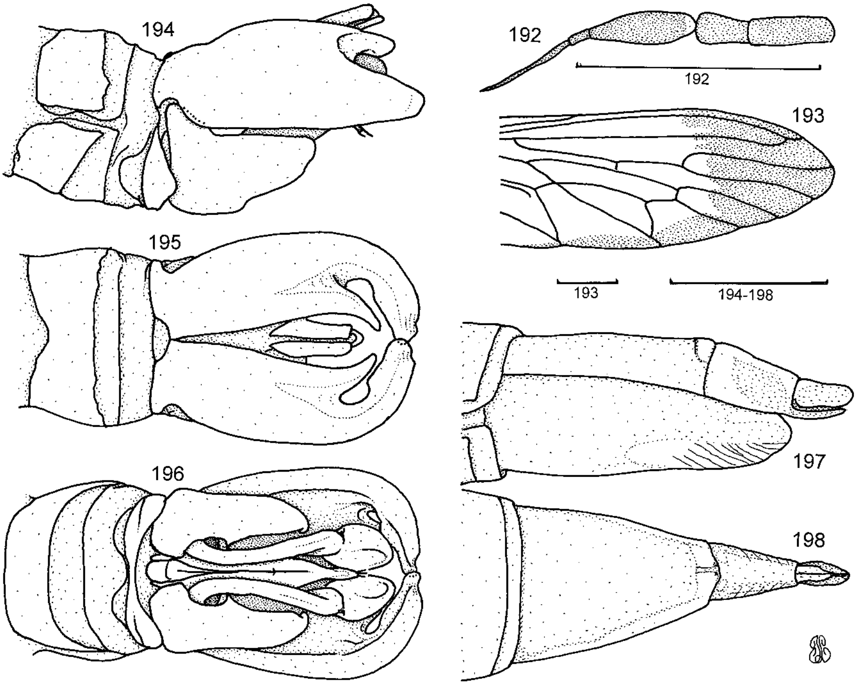
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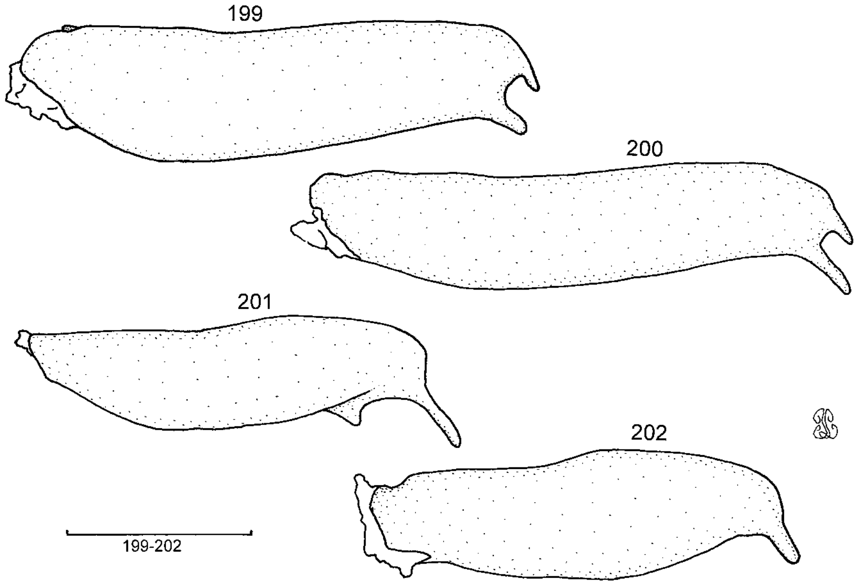
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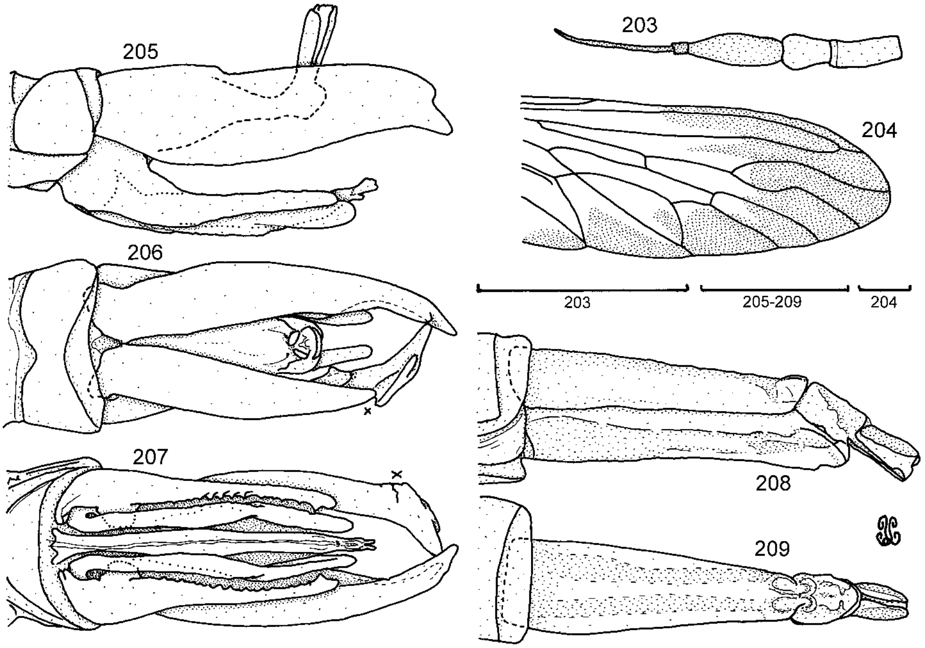
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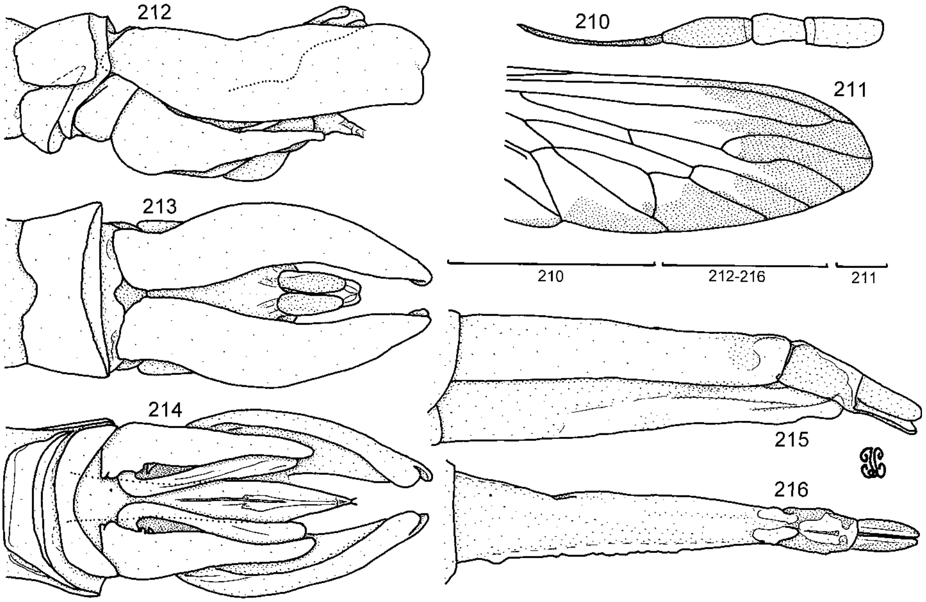
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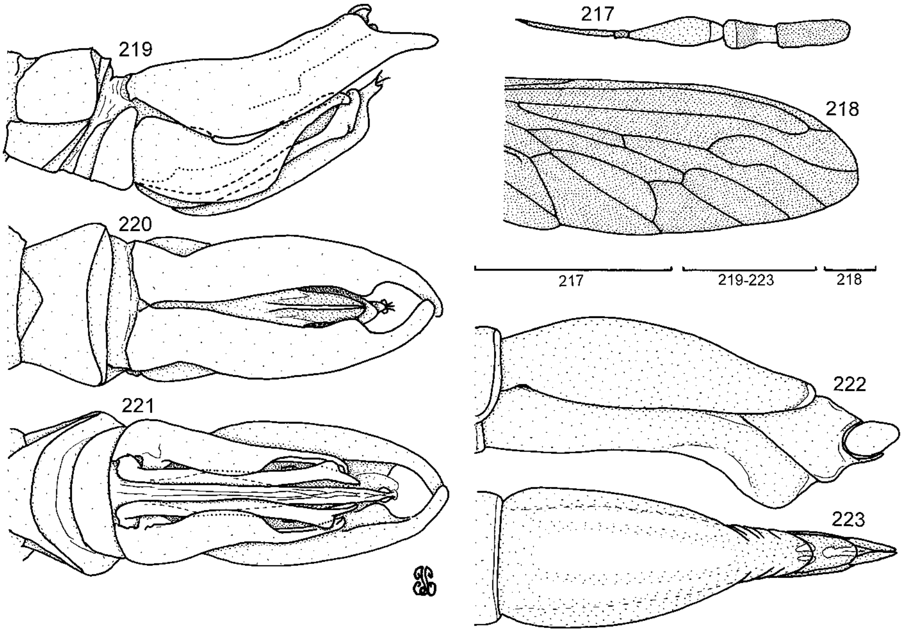
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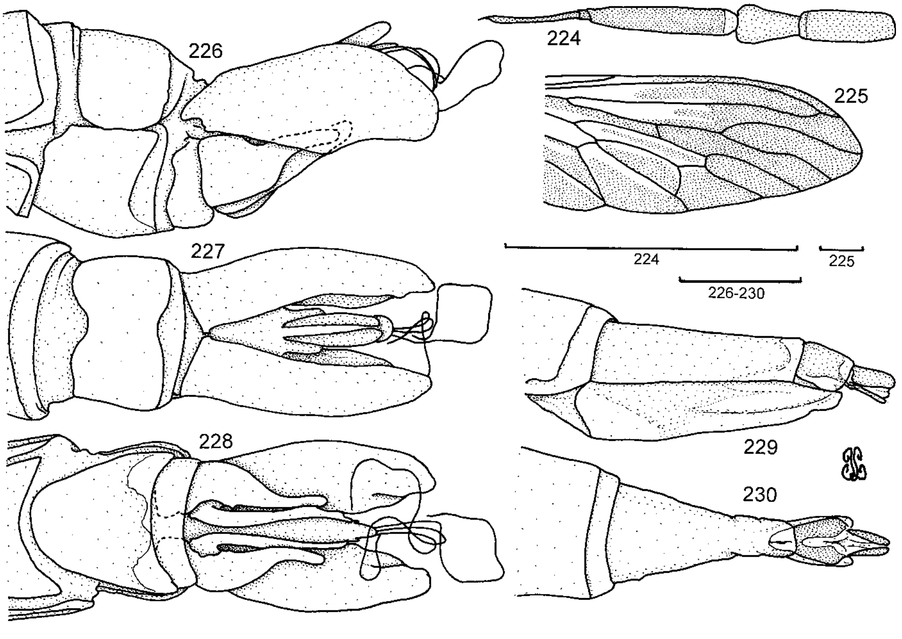
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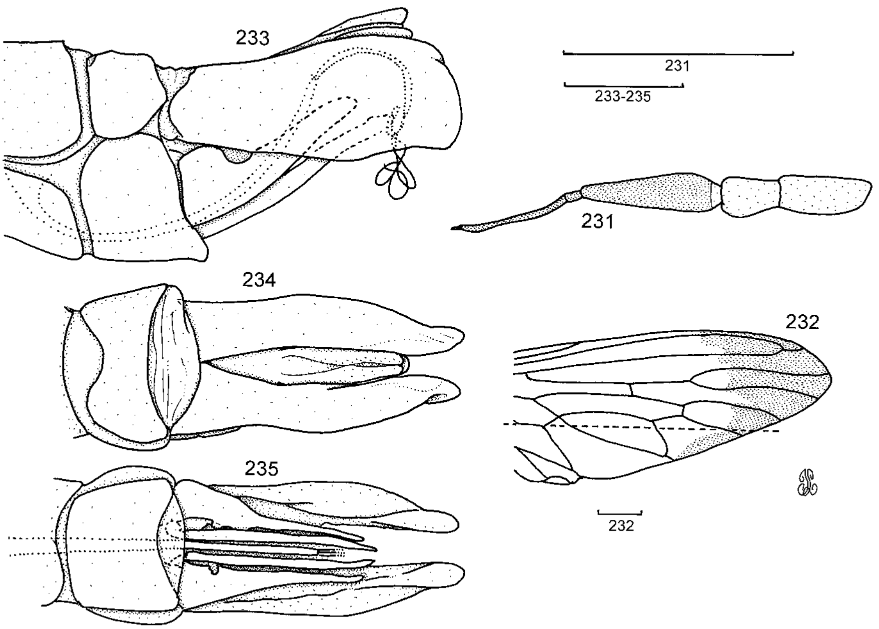
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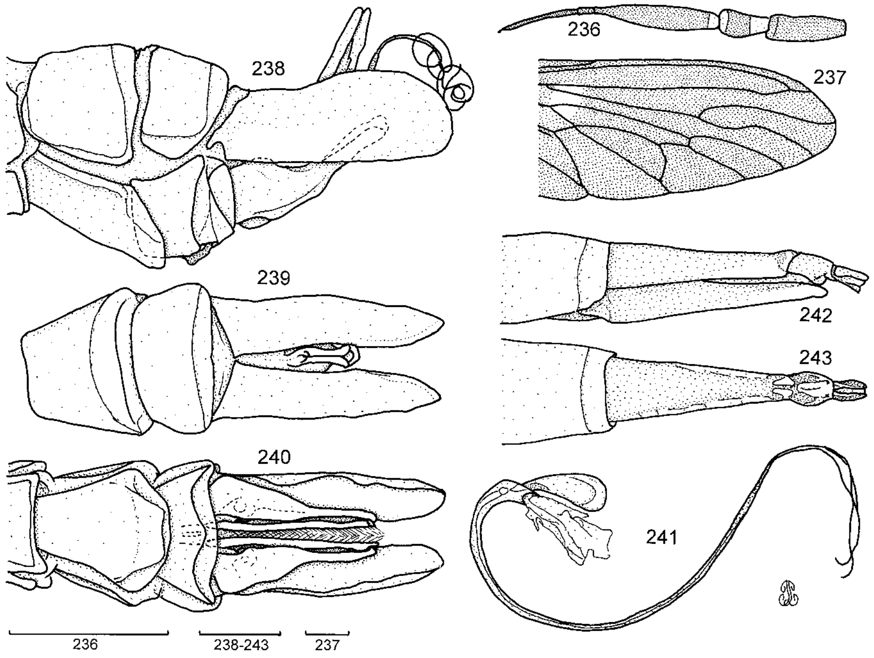
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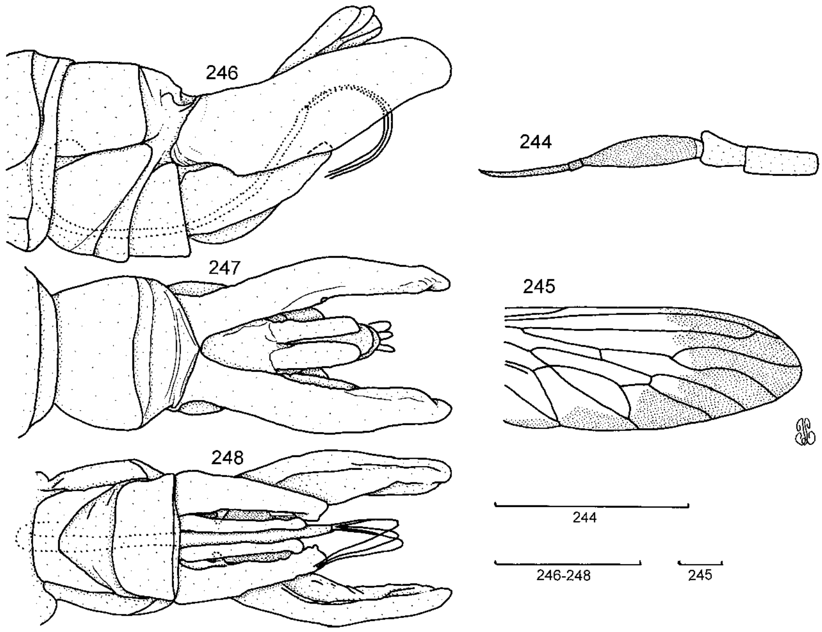

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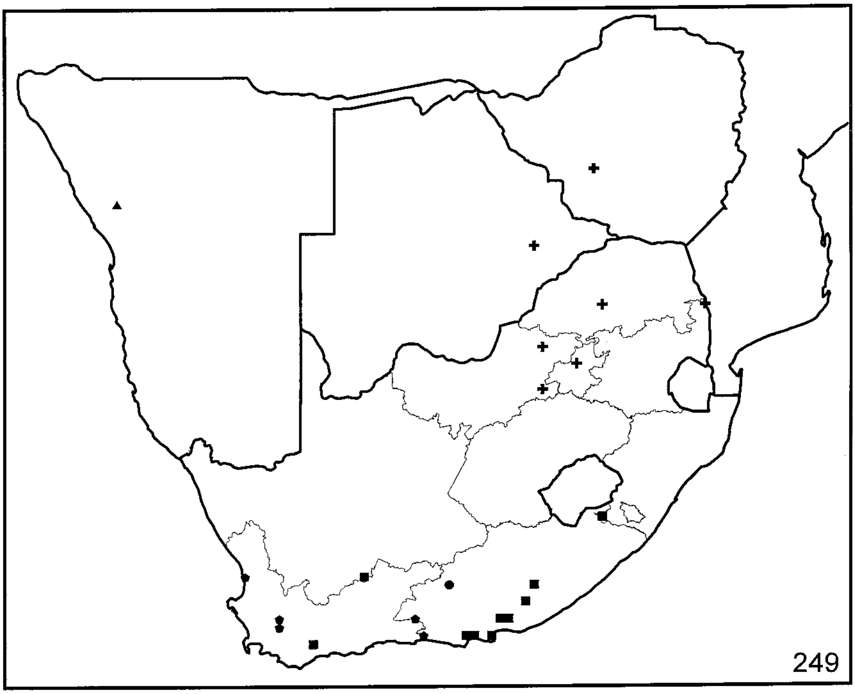


Fig. 249. Distribution of *Afromochtherus* species in southern Africa. *A. kolodrilus* (circles), *A. megastylus* (triangles), *A. melanurus* (squares), *A. peri* (crosses), *A. zoropegus* (pentagons).

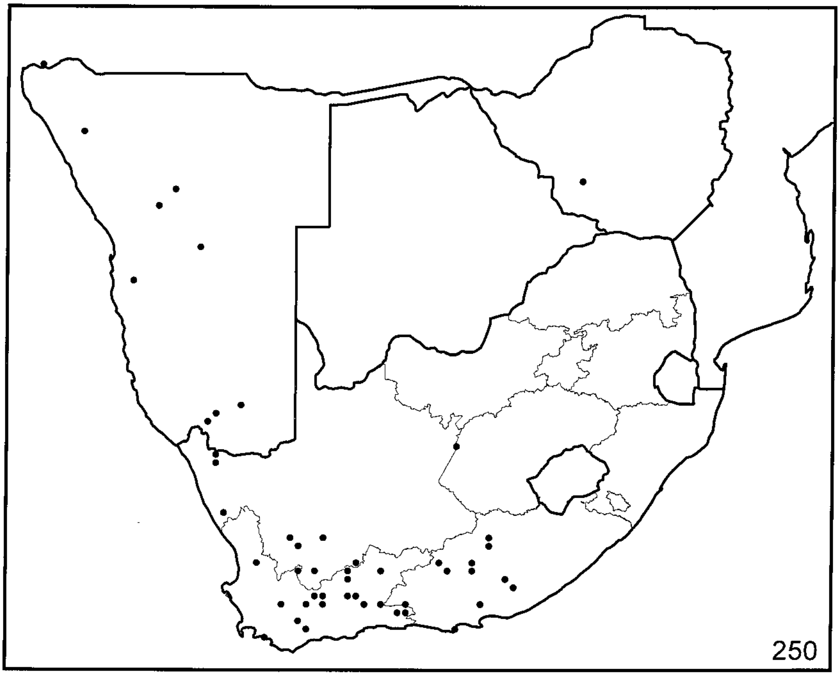
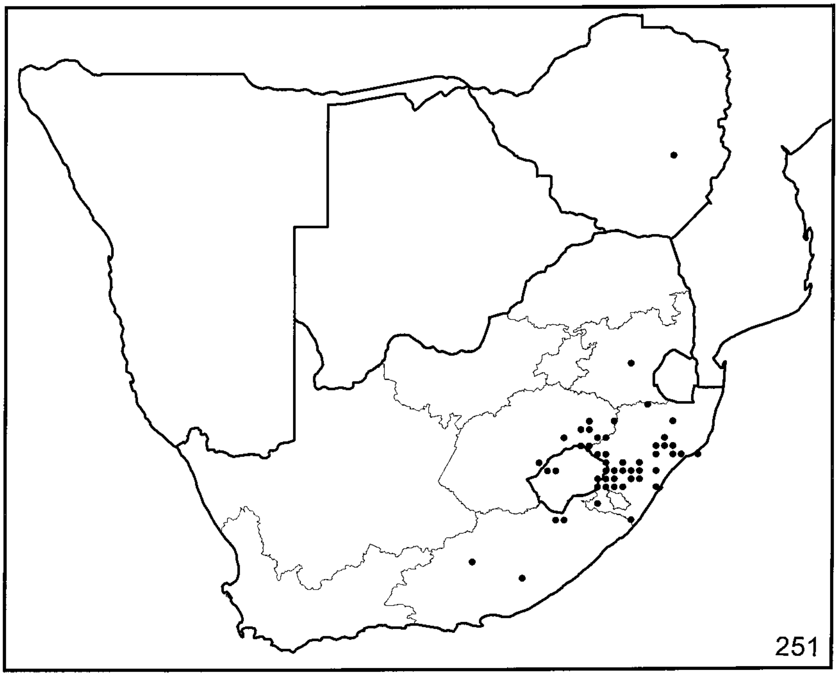


Fig. 250. Distribution of *Afromochtherus mendax*.



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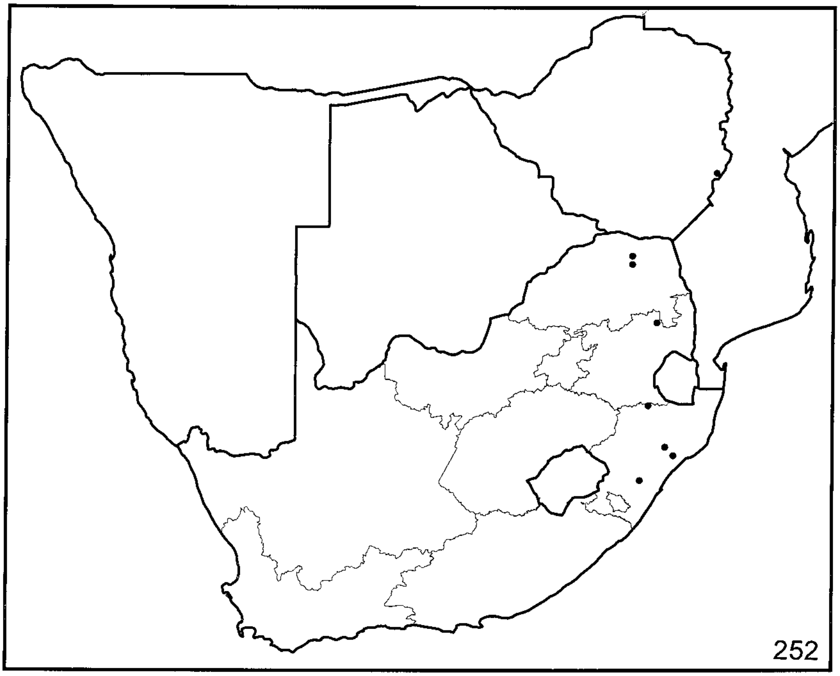

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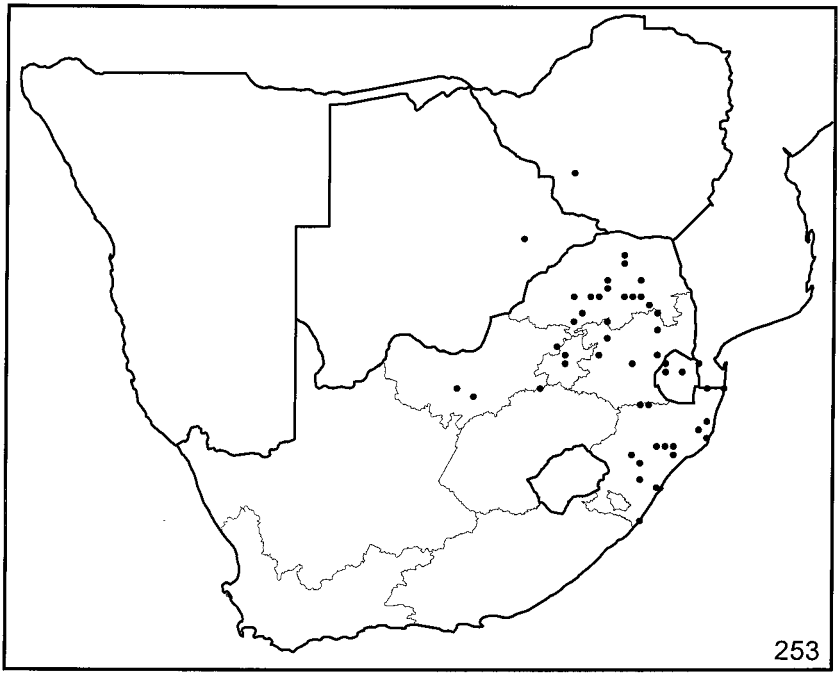

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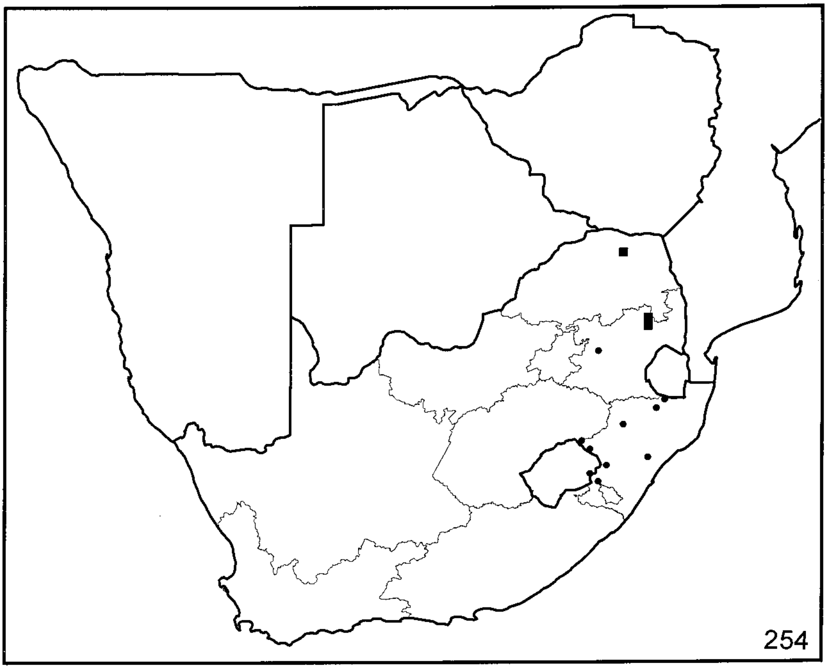
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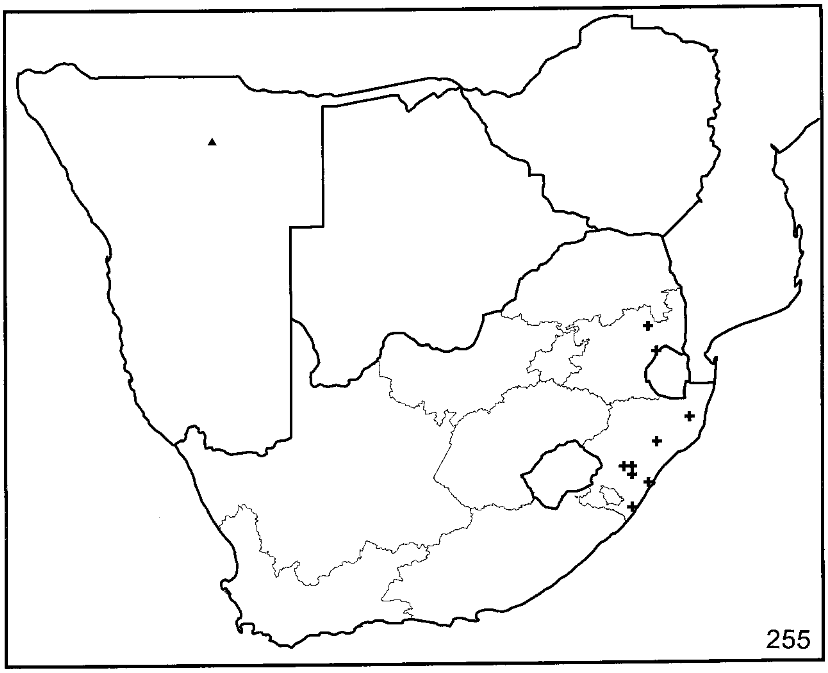
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Fig. 255. Distribution of *Valiraptor* species in southern Africa. *V. namibiensis* (triangles), *V. silvestris* (crosses).

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